



Dispensing of Pharmaceuticals-I

Learning Module

Module Code: HLT PRA₂-M-02 1217 V₁

December 2017



Preface

In response to the critical shortage of pharmacy/Medical laboratory personnel in Oromia National regional state, a group of experts from universities and colleges in the region have developed an Outcome based TVET Model curriculum for Pharmacy Level II-IV programs in October, 2017 with the initiative of Oromia Regional Health Bureau.

The outcome based curriculum was developed in reference to the level based 2011 Ethiopian Occupational standard. The guiding principle in the development of the outcome based curriculum was to train Pharmacy professionals in focused, time efficient and outcome based approach, and to fill the existing pharmacy works force shortage with competent professionals.

The key features of the outcome based curriculum include: use of variety of teaching/learning methods, repeated exposure of trainees to skill laboratories, practical attachment/cooperative training and the delivery of the training in standardized learning modules (information sheets) and skill lab manual/checklists (Operation sheets).

This learning module was developed by a diverse group of experts from higher teaching institutions in Oromia region, experts from Oromia Regional health bureau, Oromia TVET, Oromia COC agency and professional associations.

This Dispensing of Pharmaceuticals I learning Module covers 3 unit of competencies in the level II pharmacy program. The learning module covers both theoretical and practical aspects of the competencies.

Dear Trainee, you are expected to read the information presented in the learning module, attempt all the self-check questions and perform skill activities as per the skill lab learning guide/checklist.

Acknowledgment

This Dispensing of Pharmaceuticals I learning module and skill lab manual for Retail Pharmacy assisting Level II **Program** was developed by experts from Universities and Colleges in Oromia National Regional State.

Oromia Regional Health Bureau and Oromia TVET Bureau would like to acknowledge the following individuals and their organization for their dedication, kind participation, and expert contributions in the development of this training material.

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Abbreviations

CDC	Centers for Disease Control and Prevention
DICs	Drug information centers
FEFO	First expiry first out
FIFO	First in first out
FMHACA	Food, Medicine and Healthcare Administration and Control Authority
FP	Flash point
ICD	International Statistical Classification of Diseases
OSHA	Occupational Safety and Health Administration
OTC	Over-the-counter
PPE	Personal protective equipment
PRB	Prescription registration book
SDSs	safety data sheets
SOPs	Operating procedures

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1. Dispensing Environment and stock management

Objective

At the end of this chapter you will be able to

- Describe dispensing environment
- Elaborate on the use of dispensing equipments
- Outline the requirement on retail premises and facility in dispensary
- List personal protective equipments in pharmacy
- Sort role of pharmacy profession in dispensing units
- Accomplish appropriately dispensary stock management
- Perform drug arrangement in dispensing units.
- Classify pharmaceutical storage condition

1.1. Introduction

Dispensing refers to the process of preparing and supplying medicines to a named person together with clear instructions, advice and counselling on the use of medicines. It involves:

-  correct interpretation of the order for prescribed medicines
-  accurate preparation
-  labelling of medicines for use by the patient.
- Good dispensing ensures the right medicines of desired quality are delivered
 - to the right patients
 - with the right dose (strength, frequency, dosage form, quantity)
 - with clear instructions (both written and verbal)
 - with appropriate packaging.
- Any error or failure in the dispensing process can seriously affect the care of the patient.
- Programs to improve rational use concentrated on ensuring
 - rational prescribing habits
 - overlooking dispensing
 - patient's use of medicines.
- Resources involved in patient care prior to dispensing wasted if dispensing does not result in
 - ✓ named patient receiving effective form of correct drug
 - ✓ appropriate packaging with correct dose and advice.

- The following are summary of dispensing
 - A process of preparing and giving medicine to a client.
 - Correct prescription interpretation.
 - Accurate preparation & labeling of medicine.
 - Take place in health center, hospital, or community pharmacy setting.
 - Carried out by pharmacy professionals with a variety of training
- Accuracy & quality of medicines supplied lies on persons managing dispensing process
- Dispensing staffs need
 - technical knowledge and skills necessary to dispense.
 - effective communication with patients or care givers.

1.2. Dispensing environment

A safe, clean and organized working environment provides the basis for good dispensing practice. Dispensing environments must be clean, because medicinal products which are used on human being should be hygienic and uncontaminated. The environment must also be organized so that dispensing can be performed accurately and efficiently. In retail environment approaching customer in good manner, matching customer needs and providing drug information is very vital.

Clients may be required to wait while their prescriptions are being filled, so a waiting area should be available as pharmacist need enough time to attend to the queries of the patient.

Appropriate waiting area in dispensing room should have the following:

- ❖ Comfortable chairs/place to sit (at least for the elderly/disabled/ sick patient to rest
- ❖ Current popular health magazines and selected materials related with health to keep the clients busy/occupied, and prevent boredom while waiting to receive medicines
- ❖ Pamphlets and posters related to public, family and other individuals health problems prominently displayed (as the waiting area could be used as education center)

1. Premise and Facility

The premises on which a dispensing service is provided would reflect the quality of service and inspire confidence on patients in the nature of pharmaceutical service delivered.

- Requirements for Premise and Facility
 - The walls, floors, windows, ceiling, and all other parts of the premises should be as per the requirement set by the regulatory body Food, Medicine and Healthcare Administration and Control Authority (FMHACA).
 - Rooms with minimum area specified required for dispensing & storing medicines.
 - Toilet with water supply and drainage system is also a requirement.
 - All parts of the premises should be maintained in an orderly and tidy condition.
 - Pharmaceutical products should be protected from the adverse effect of light, freezing or temperature extremes and humidity.
- The dispensing environment should possess:
 - Appropriate temperature with sufficient lighting
 - Optimum humidity control
 - Cold storage facilities
 - Adequate number and type of shelves
 - Lockable cabinet for controlled substance & poisons
 - Patient/care provider waiting area
 - Sufficient dispensing equipments, etc.

2. Hygiene and Sanitation

- The physical surroundings must be maintained free of dust and dirt materials.
- Locate in a protected place
- Not open to a road or dust, dirt, and pollution.
- Requires a regular routine of cleaning shelves
- A daily cleaning of floors and working surfaces.

There should be a regular schedule for

- Checking, cleaning, and defrosting refrigerator.
 - Spills should be wiped up immediately
 - ☞ especially if liquid spilled is sticky, sweet, or attractive to insects.
 - Food and drink must be kept out of the dispensing area
 - Refrigerator used strictly for medicines use only.
- Smoking should be prohibited in area where medicines are dispensed or supplied.

- Direct contact between the operator's hands and the dispensed products should be avoided
- Dispensing equipment used for counting pills should be kept clean at all times.
 - ✚ e.g., uncoated tablets leave a layer of powder on any surface they touch, which can easily be transferred to other tablets or capsules counted on the same surface.
- All persons engaged in dispensing should
 - ✚ observe high standards of personal cleanliness
 - ✚ wear protective cloths that should be cleaned regularly.

3. Patient counseling area

- A designated area where activities related to patient care/ professional services carried out.
- The patient's attention can be drawn to this area and services offered using suitable panels.

❖ This serve the following

- clarifications about doubts (no fear of being overheard).
- comfortable and convenient than advising on the counter.
- easy for demonstrations of using devices like inhalers, vaginal or rectal applicators
- Makes the patient confident that he/she will be heard without distractions.

4. Dispensing equipment's

- Adequate equipment's on premises are suitable for operations that have to be carried out.
- All equipment should be kept clean and checked for cleanliness prior to each use.
- Thoroughly clean equipments to prevent any risk of contamination.
- Use of stainless steel and glass is recommended.

❖ Dispensing aids include:

- A dispensing bench of adequate size having a smooth, impervious working surface.
- Easily cleanable tablets and capsules counting devices.
- A refrigerator equipped with a maximum/minimum thermometer adjusting.
- Suitable dispensing containers for drugs with separate sets for internal and external use.
- Adequate shelves and lockable cabinets etc.
- Cleaning equipment used for handling different products, both between uses and at the end of the day, is essential to prevent cross-contamination.
- Clear labeling that ensure selection of correct preparation & minimize risk of error.

a) Triangular tablet counter

- made of wood, metal or plastic with raised edges along two sides.
- metal or plastic counters preferred (easily cleaned or washed between uses).
- tablets are counted by counting the number of rows of tablets
- pours tablets into the container using a raised edge as a guide.

b) Capsule counter

- + a metal tray which consists of 10 rows of grooves.
- + capsules are poured on to the tray using a spatula lined up in grooves.
- + each complete row will contain capsules
- + so the number of complete rows multiplied by 10 gives number of capsules.

c) Electronic tablet counter

- Used when prepackaging is done on a large scale in a teaching hospitals.
 - difficult to clean
 - may not identify damaged tablets
 - expensive for medicine retail outlets.



Pills counter



Triangular pills counter



Capsule counter



Pills splitter

Figure 1-1: Dispensing equipments used in dispensing units

5. Personal protective equipment's

Personal protective equipment (PPE), as defined by the Occupational Safety and Health Administration (OSHA) is 'specialized clothing or equipment, worn by an employee for protection against infectious materials'.

- PPE protects health professional from
 - contamination by work area hazards
 - prevents contamination of clothes which would carry contamination outside health facility

The Centers for Disease Control and Prevention (CDC) issues recommendations for when and what PPE should be used to prevent exposure to infectious diseases. The protection of healthcare personnel from infectious disease exposures in the workplace requires a combination of controls.

There are four major components to healthcare worker safety programs.

- ✚ Training and administrative controls, like isolation policies and procedures for recognizing patients with a communicable disease before they expose workers.
- ✚ Engineering controls like negative pressure rooms for patients with airborne diseases
- ✚ Work practice controls such as not recapping needles
- ✚ Finally personal protective equipment.

➤ Types of PPE used in healthcare settings

- Gloves – protect hands
- Gowns/aprons – protect skin and/or clothing
- Masks- protect mouth/nose, respirators – protect respiratory tract
- Goggles – protect eyes
- Face shields – protect face, mouth, nose, and eyes

6. Dispensing personnel

- Difference between supplying medicines or medical supplies and supplying other goods is that, with medicines or medical supplies the recipient/patient usually
 - does not know the correct use
 - unable to judge the quality of the product he or she receives.
 - correctness and quality of medicines supplied lies entirely on dispenser's ability.
- Consequently laws mandate that the distribution of medicines and important medical supplies to the general public be carried out by pharmacy professionals.

- Knowledge, skills, and attitudes to complete dispensing process includes
 - knowledge about medicines being dispensed (common use, correct dose, precautions, common side effects & interactions with other medicines or food, storage needs).
 - Good calculation and arithmetic skills
 - Skills in assessing the quality of preparations
 - Attributes of cleanliness, accuracy, and honesty
 - Attitudes and skills required to communicate effectively with patients
- The level of training needed for any particular dispensing task is determined by
 - ✓ range of medicines dispensed and
 - ✓ extent to which calculation and preparation are required.
- Dispensing personnel must receive an appropriate level of training, which will enable them to correctly dispense the range of medicines prescribed in their facilities.

Skill Practice Session 1: Practice on dispensing aid/equipment

Purpose:

- ☞ The purpose of this activity is to enable you to practice those skills necessary to use dispensing equipment or aid.

Instructions:

- Based on the available dispensing aid, practice one by one how to dispense medicine using dispensing aid.

Resources (Equipment tools and Materials):

- Pill Splitter
- Tablet/Capsule counter tray
- Measuring cylinders
- Dropper

1.3. Dispensary stock management

- Good stock management facilitates safe and effective dispensing service.
- To ensure proper stock management, the following elements are important:
 - Acquisition of medicines
 - Stock keeping and rotation
 - Arrangement of medicines
 - Storage conditions
 - Categories of drugs

1. Dispensary Medicines Acquisition

Before medicines and medical supplies are issued from store to dispensing room

-  Store requisition form should be filled by the dispenser
-  Duly signed by authorized personnel.

All medicines found in medicine retail outlets should be obtained or collected from legal sources.

- When you **receive medicines** for dispensing:
 - ❖ Ensure that there is sufficient storage place
 - ❖ Prepare and clean the areas for receiving and storing
 - ❖ Inspect packages for damaged and/or expired products
 - ❖ Check that all original containers are unopened and in good condition.
- If **products are defective**:
 - Separate the damaged or expired stock from the usable stock
 - Refuse to accept the products and note the problem(s) on the delivery note
 - Follow your facility's procedure for handling damaged or expired stock.
 - Report quality problem to the nearest regulatory body and fill prepaid adverse drug event report form and send to FMHACA.
- If Products are **not damaged**:
 - Fill issue voucher and requisition voucher
 - Count the number of units for each product received and compares to issue voucher
 - Record received item on receiving voucher, bin card and computer (if applicable)
 - Ensure the expiry date is visibly marked on every package or unit

- Arrange products in the storage area that facilitate the dispensing of the first to expire by first expiry first out (FEFO) or first in first out (FIFO) procedures.

2. Dispensary stock keeping

Medicine should be kept within the dispensary as follows:

- Follow the manufacturer directions when stocking
- Follow labels for storage conditions
- Ensure safe custody of poisons
- Place liquid products on the lower shelves or on bottom of stacks
- Store products that require cold storage in appropriate temperature controlled zones.
- Keep high security/high value products (narcotic and psychotropic substances) in appropriate secured places
- Separate damaged and expired products from the usable stock without delay and dispose using established disposal procedures.
- Always store all products in a manner that facilitates FEFO principles
- Report to appropriate body for redistribution of medicines with near expiry date.

3. Dispensary stock rotation

- Following FEFO and FIFO procedures minimize wastage due to product expiry.
- Issue products that expire first, ensuring they are not too close to or past their expiration date (shelf life remaining is sufficient for product to be used before expiry date).
 - To facilitate FEFO, place products that expire first in front of later expiry products.
 - Write expiry dates on bin cards, so that stocks can be used before they expire.
 - Supplies with no expiry date (gauze, cotton, medical gases etc.) should be stored in the order received and dispensed accordingly (FIFO).

4. Arranging medications in dispensary

- Dispensing units must have a known system for organizing medicines.
- Medicines should be arranged on shelves made of steel, treated wood, strong and robust.
- Health institutions and retail outlets can use one or a combination of the following:
 - a. Pharmacotherapeutic category
 - b. Alphabetical order by generic name
 - c. Dosage forms of final preparation

a) Pharmacotherapeutic category

- This method is based on the pharmacological or therapeutics use of drugs.
- Pharmacological classification is an effective way of organizing medicines in dispensaries.
- Pharmacologic class knowledge is critical step in effective dispensing in this system.

b) Alphabetical order

- Alphabetical order by generic name is attractive in dispensaries that keep a small items.
- Each change in the level-of-use list requires reorganization of the dispensary
- May not result in optimal use of available space.

c) Dosage form of final preparation

- Arranging drugs as per the dosage form they are available
- Commonly used in smaller dispensaries.
- Easy to recognize when receiving goods
- Allows optimal use of space.
- Usually used in conjunction with the therapeutic arrangement.
 - Solid dosage forms (tablets, capsules, powers) are placed together
 - Liquid dosage forms (elixirs, syrups, suspensions,...) are placed together
 - Semi solid dosage forms (ointments, creams, pastes) are placed together
- In arranging medicines, the following points should be considered:
 - Each dosage form of medicine is arranged in separate and distinct areas
 - Sufficient empty space should demarcate one medicine or dosage form from another
 - Put medicine in well ventilated, dry and place protected from direct sun light and heat
 - Store liquids in a pallet on the floor or on the lowest shelf
 - Do not store anything directly on the floor and store cold-chain items in refrigerator.

Skill Practice session 2: GIT Medicines Arrangement

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction: Demonstrate Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Sucralfate, Bisacodyl, Meclizine Hydrochloride, Chlorpromazine Hydrochloride, Metoclopramide, Atropine sulphate, Hyoscine (Scopolamine) Butylbromide, Oral Rehydration Salt, Esomeprazole, Dimenhydrinate, Cimetidine, Ondansetron, Magnesium Hydroxide, Cimetidine, Omeprazole, Aluminum Hydroxide+Magnesium Trisilicate, Ranitidine, Castor oil, Magnesium Sulphate, Loperamide, Zinc Sulphate, Activated Charcoal, Aluminum Hydroxide + Magnesium Hydroxide + Simethicone

Antacids	Antiemetics
Histamine 2 Blockers	Cathartics and Laxatives
Proton Pump Inhibitors	Medicines Used in Diarrhea
Antispasmodics	Antiflatulents

Skill Practice session 3: CNS and Musculoskeletal System Medicines Arrangement

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction: Demonstrate Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Risperidone , Lithium Carbonate, Levodopa, Carbamazepine, Diazepam, Lidocaine, Fluoxetine, Imipramine, Carbamazepine, Ergotamine Tartrate + Caffeine, Tramadol, Acetaminophen, Indomethacin, Ibuprofen, Morphine, Acetylsalicylic Acid, Bromazepam, Sumatriptan, Diazepam, Phenytoin, Ibuprofen, Pancuronium, Tetracaine, Clozapine, Phenobarbitone, Amitriptyline, Codeine Phosphate, Diclofenac, Pethidine, Clonazepam, Benzhexol, Levodopa + Carbidopa, Chlorpromazine, Allopurinol,

Analgesics/Antipyretics	Antimigraine Medicine
Hypnotics and Anxiolytics	Antidepressants
Anticonvulsants	Anti-Parkinson Medicines
Antipsychotic Medicines	Mood Stabilizer
Local Anesthetics	Neuromuscular Blockers
Medicines used in Gout	

Skill Practice session 4: CVS Medicines Arrangement

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction: Demonstrate Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Procainamide, Enalapril, Propranolol, Captopril, Verapamil, Frusemide, Amiodarone, Norepinephrine, Phenylephrine, Lidocaine, Metoprolol, , Hydrochlorthiazide, Mannitol, Spironolactone, Valsartan, Digoxin , Enalapril Maleate, Lisinopril, Amlodipine, Methyldopa, Nifedipine, Hydralazine, Atrovastatin, Cholestyramine, Simvastatin, Isosorbide dinitrate , Atenolol, Nitroglycerine, Dopamine, Dobutamine

Medicines Heart Failure	Antiarrhythmics ,
Antihypertensive ,	Diuretics
Antilipemic Agents,	Medicines Used for Angina/Ischemic Heart Disease,
Medicines Used in Vascular Shock	

Skill Practice session 5: Anti-infective Medicines Arrangement

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction 1: Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Artesunate, Tinidazole, Praziquantel, Nystatin, Gentamicin, Ganciclovir, Ketoconazole, Doxycycline, Amoxicillin, Ampicillin, Amoxicillin + Clavulanic Acid, Chloramphenicol, Erythromycin, Quinine, Miconazole, Metronidazole, Thiabendazole, Acyclovir, Clarithromycin, Cephalexin, Ceftriaxone, Ciprofloxacin, Nevirapine, Vanciclovir, Tenofovir, Chloroquine Phosphate, Fluconazole, Albendazole, Diloxanide Furoate, Artemether + Lumefantrine, Piperazine, Clindamycin, Ethambutol, Isoniazid, Sulfadoxine + Pyrimethamine, Zidovudine, Praziquantel, Griseofulvin, Lamivudine, Efavirenz, Lamivudine, Abacavir, Atazanavir/ Ritonavir, Clotrimazole, Rifampicin, Dapsone, Streptomycin, Vancomycin, Tetracycline, Norfloxacin, Azithromycin, Penicillin G, Sodium Crystalline, Cloxacillin, Procaine Penicillin Fortified, Penicillin G Benzathin

Penicillins	Anti- tuberculosis drugs
Anthelmintics	Antileprotics
Antiretrovirals	Antifungals
Amoebicides	Antimalarials
Medicines for Toxoplasmosis	Schistosomicides
Antigiardial Agents	Antileishmania Medicines

Instruction 2: Arrange the following Antiinfectives as Antibacterial, Antifungals, Antivirals, Antiprotozoals and Anthelmintic (tick to the column).

Antiinfectives	Antibacterial	Antifungals	Antivirals	Antiprotozoals	Anthelmintic
Ampicillin					
Ceftriaxone					
Metronidazole					
Tinidazole					
Cephalexin					
Doxycycline					
Ceftriaxone					
Erythromycin					
Clarithromycin					
Azithromycin					
Gentamicin					
Ciprofloxacin					
Norfloxacin					
Artisunate					
Chloroquine					
Quinine					
Mebendazole					
Griseoflovin					
Fluconazole					
Acyclovir					
Zidovudine					
Efavirenz					
Ritonavir					
Ivermectin					
Albendazole					
Isoniazid					

Skill Practice session 6: Arrangement of medicines used in endocrine disorder and contraceptives

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction: Demonstrate Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Propylthiouracil, Metformin, Betamethasone, Glibenclamide, Thyroxine sodium, Dexamethasone, Hydrocortisone, Methylprednisolone Acetate, Prednisolone, Triamcinolone Acetonide, Norethindrone (Norethisterone), Hydroxyprogesterone Caproate, Norethindrone (Norethisterone), Ethinylestradiol, Levonorgestrel (D-Norgestrel), Levonorgestrel (D-Norgestrel), Medroxyprogesterone Acetate, Norethindrone Condoms, Copper T380A, Glucagon, Insulin , , Levonorgestrel (D-Norgestrel) + Ethinylestradiol ,Estradiol Aqueous Iodine Solution (Iodine + Potassium Iodide) ,

Corticosteroid Preparations	Thyroid Hormones and Anti-thyroid agents
Anti-thyroid Agents	Insulin and Oral Antidiabetic Agents
Contraceptives	Female Sex Hormone Preparations

Skill Practice session 7: Miscellaneous Medicines Arrangement

Purpose:

- To enable you to practice those skills necessary to arrange medicines in dispensary.

Instruction: Demonstrate Arrangement of the following medicines in dispensary based on their Pharmacological action/class listed on the table below

Heparin, Hydrocortisone, Aminophylline, Chlorpheniramine, Dexamethasone, Thiamine Hydrochloride (Vitamin B1), Methylprednisolone, Adrenaline, Diphenhydramine Hydrochloride, Loratidine, Ascorbic acid (Vitamin C), Ferrous Salt, Folic Acid, Cholecalciferol (Vitamin D3), Phytomenadione (Vitamin K1), Diphenhydramine, Pyridoxine Hydrochloride (Vitamin B6), Calcium Gluconate, Potassium Chloride, Dextrose, Dextrose in Normal Saline, Lactated Ringer's Solution, Warfarin, Folinic Acid, Dextromethorphan, Salbutamol, Adrenaline, Guaifenesin, Ephedrine + Theophylline

Anticoagulants	Antihistamines
Anti-inflammatory/anti-allergic medicines	Medicines used in allergic emergencies
Medicines used in allergy	Vitamins
Medicines used for correcting water, electrolyte and acid base balance	Antianemic agents
Antitussives/Expectorants	Bronchodilators/Antiasthmatics

5. Storage of pharmaceuticals in dispensary

In dispensing room storage conditions can be arranged in two classes:

- A. Normal storage conditions
- B. Special storage conditions
 - a. Cold storage conditions
 - b. Combustible /flammable
 - c. Secured storage

A. Normal storage conditions

- Storage in dry, well-ventilated premises at temperatures of 15–25°C or up to 30 °C.
- Unless special storage conditions are stated, it is vital that drugs be stored in:
 - a dry place
 - adequately ventilated shady
 - cool store room.
- Maintain specified storage conditions with regard to exposure to humidity, sunlight, heat.
- When a product label states, ‘protect from moisture’, store the product in a space with no more than 60% relative humidity.
- Free air circulation through windows, fans or air conditioners reduce effects of humidity.
- Some products are photosensitive and will be damaged if exposed to light.

To protect products from sunlight:

- shade the windows, if they allow passage of direct sunlight, keep products in carton
- do not store or pack products in sunlight
- **Heat will also affect many products**, melts ointments and creams and affects other products.
- Thermometers and hygrometer to regulate the temperature and humidity of storage areas.

B. Special storage conditions

- Some categories of medicines and supplies require special storage conditions
 - Cold storage conditions
 - Flammable storage conditions
 - Secured storage.

a. Cold storage conditions

- Maintained by using refrigerators and freezers for products that may be degraded rapidly when kept at room temperature or even at cool places.
- Example of products that should be stored in cold storage condition includes
 - Vaccines and insulin preparation
 - Oxytocin & ergometrine
 - Antibiotics and tetanus antitoxin
 - Anti-D and biological products.
- The following points are recommended when using refrigerators and freezers:
 - ✚ Refrigerators that open on the top are more efficient than vertical ones, because hot air rises while cold air falls, the coldest part of vertical refrigerators is at the bottom so store products that are sensitive to freezing or very low temperatures on the upper shelves.
 - ✚ If there is enough space, place a few plastic bottles of water in the refrigerator; this will help maintain the temperature for a longer period of time if the power is cut off.
 - ✚ The temperature ranges for different storage conditions are shown in the following table.
 - ✚ Opening and closing the door lowers the temperature and causes medicines to deteriorate.
 - ✚ Record temperature daily & check enough space around refrigerator so air can move freely.
 - ✚ Do not keep staff food in the refrigerator.

Table 4-1: Terms that relate to storage temperature

No	Terms to specify temperature	Applications
1.	Store frozen(-20°C (4°F))	For products like vaccine which need to be transported within cold chain
2.	Store at 2°C – 8°C(36° - 46°F)	For products which are very sensitive but must not be frozen. This temperature is appropriate for storing vaccines for short time.
3.	Keep at cool place	Kept between 8°C – 15°C (59°F – 77°F) temperature
4.	Store at room temperature	To be kept between 15°C – 25°C (45°F – 59°F)
5.	Store at ambient temperature	Store at the surrounding temperature. It means “room temperature” or normal storage conditions, i.e. storage in a dry, clean well-ventilated area room temperature between 15°C – 25°C (59°F- 77°F) or up to 30°C depending on climatic condition.
NB: When storing, follow manufacturer’s recommendations on storage conditions of specific products.		

b. Storage for combustible /flammable

The Occupational Safety & Health Administration defines a flammable liquid as substances having a flash point of not more than 93°C (199.4°F). The **flash point** (FP) is the minimum temperature at which a liquid **gives off vapor** in sufficient concentration to form an ignitable mixture with air near surface of the liquid. Relative hazard of flammable liquid increases as flashpoint decreases.

Many common solvents (e.g., acetone, ether, toluene, etc.) present in laboratories have flash points below room temperature, making proper use, storage and disposal even more critical. Flammable liquids and mixtures are assigned to one of four hazard categories, as indicated in safety data sheets (SDSs), based on their flash points and boiling points.

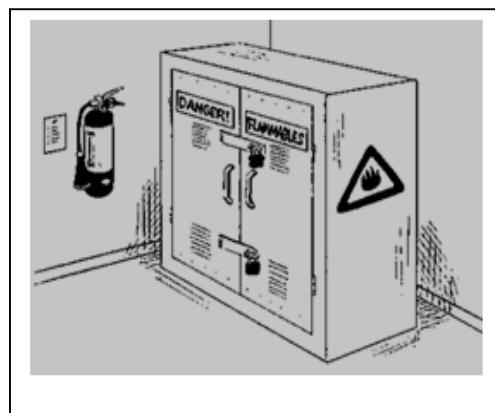
Table 4-2: Categories of flammable substances

Category	Criteria	Hazard statements
1.	FP < 23°C & initial boiling point ≤ 35°C	Extremely flammable liquid & vapor
2.	FP < 23°C & initial boiling point > 35°C	Highly flammable liquid & vapor
3.	Flash point ≥ 23°C and ≤ 60°C (140°F)	Flammable liquid and vapor
4.	FP ≥ 60°C (140°F) ≤ 93°C (200°F)	Combustible liquid

- Combustibles like alcohol, ether must be stored in special or separate rooms.
- Flammable materials must be stored in a small, separate special location that prevent fire spread throughout the store.
- All stores should be equipped with fire extinguishers.
- A good alternative to fire extinguishers is represented by wooden or metal buckets filled with sand. Store flammables in their original container.

Corrosive or oxidant substances commonly found in hospitals are:

- trichloroacetic acid
- glacial acetic acid
- concentrated ammonia solutions
- silver or sodium nitrate
- sodium hydroxide pellets.
- Always store corrosive substances
 - ✚ away from flammables
 - ✚ in a separate steel cabinet to prevent leakage.
 - ✚ use appropriate protective gloves and eyeglasses when handling.

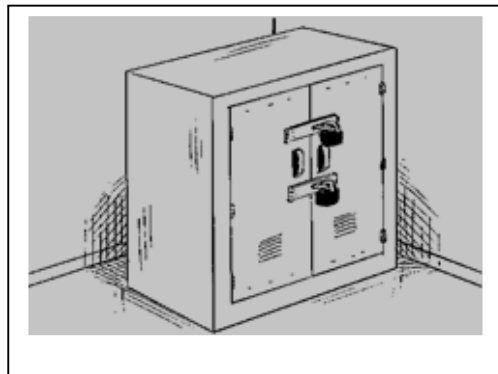


c. Secured storage conditions

- Products that need storage in an access-controlled (security for storage) environment.
 - ☞ those at risk of theft
 - ☞ with abuse potential for addiction
 - ☞ in high demand
 - ☞ those that have potential for resale

Products that require secured storage conditions

- **Narcotics:** morphine, opium, pethidine, pentazocine, codeine, hydrocodone, oxycodone.
- **Psychotropics:** clonazepam, diazepam, temazepam, nitrazepam, lorazepam.
- **Other medicines:** antiretroviral used to treat HIV/AIDS, may need storage in a controlled facility, because they are scarce, expensive, and in high demand.
- **Donation products** that also used for other conditions
 - medicines used to treat opportunistic infections for HIV/AIDS
 - medicines used to treat sexually transmitted infections
 - HIV test kits used in use in specific programs, such as preventing mother-to-child transmission, but can be used for other purposes, such as ensuring **blood safety**.
- These medicines need greater attention.
 - specific procedures needed for procurement, reception, storage and dispensing.
 - special ordering forms should be used.
- Controlled substances and their documents kept in securely locked rooms or cupboards.
 - keys should be kept in a secure place.
 - only authorized pharmacy professional have access.
 - warning light or bell will be activated if products are accessed improperly.
 -



6. Drugs categories

Based on legal factors drugs are classified into three legal classes.

- Prescription only drugs/Legend drugs that cannot dispensed by a pharmacist without a prescription from a physician.
- Controlled drugs in addition to requiring a prescription, these drugs require additional safeguards for storage and refills are also limited.
- Over-the-counter drugs that do not require a prescription.

A. Controlled drugs

Controlled drug is any drug or therapeutic agent with a potential for abuse or addiction, which is held under strict governmental control. A controlled (scheduled) drug is one whose use and distribution is tightly controlled because of its abuse potential or risk. Controlled drugs are rated in the order of their abuse risk and placed in schedules by the Federal Drug Enforcement Administration (DEA) of USA.

The drugs with the highest abuse potential are placed in Schedule I, and those with the lowest abuse potential are in Schedule V. These schedules are commonly shown as C-I, C-II, C-III, C-IV, and C-V. Substances are placed in their respective schedules based on whether they have a currently accepted medical use, relative abuse potential & likelihood of dependence when abused.

Table 8-1: **Classification of controlled substances**

Schedule	Abuse potential	Comments
I	High	No accepted medical use; lack of accepted safety as drug. Subject to all measures of control (use, production, export and import). Example, heroin, marijuana (cannabis), lysergic acid diethylamide (LSD), mescaline (peyote), khat , ecstasy, methaqualone, psilocybin.
II	High	Current accepted medical use. Abuse may lead to psychological or physical dependence. Less strict control than schedule I drugs. Example: hydromorphone, methadone, meperidine, oxycodone, fentanyl, morphine, opium, codeine, amphetamine, methylphenidate and methamphetamine.
III	Less than I or II	Current accepted medical use. Moderate or low potential for physical dependence and high potential for psychological dependence.

		Example: combination products containing less than 15 mg of hydrocodone per dosage unit, products containing not more than 90 mg of codeine per dosage unit, buprenorphine, barbiturates (amobarbital, pentobarbital), glutethimide, ketamine, benzphetamine, phendimetrazine and anabolic steroids
IV	Less than III	Current accepted medical use. Limited potential for dependence. Example: Barbiturates (allobarbitol, secobarbital, phenobarbital), benzodiazepine (alprazolam, clonazepam, lorazepam, diazepam, lorazepam, midazolam, temazepam, and triazolam), carisoprodol.
V	Less than IV	Current accepted medical use. Limited dependence possible. Consist primarily of preparations containing limited quantities of certain narcotics. Example: cough preparations containing not more than 200 mg of codeine per 100 mL per 100 grams), and ezogabine.

- Required information on the prescription for controlled substances
 - ✓ date and signature on the day it is issued.
 - ✓ name and address of the patient.
 - ✓ name, address, and registration number of the physician.
 - ✓ may be prepared by the secretary, but must be signed by the physician.
- **Refilling prescriptions for controlled substances**
 - ✚ Refills for schedule II drugs are not permitted.
 - ✚ Refills for schedule III, IV & V permitted if number of refills is indicated on prescription.
 - ✚ Prescription order renewed only up to five times within six months after the date of issue.
 - ✚ After five renewals or after six months a new prescription order is required.

B. Over the counter drugs

Over-the-counter (OTC) medicines are medicines that may be sold directly to a consumer without a prescription from pharmacy personnel, as compared to prescription drugs, which are dispensed only to consumers possessing a valid prescription. While dispensing, asking the patient why he/she is buying the drug is crucial before dispensing. The maximum quantity to be dispensed at one time is specified on the National OTC drug list manual 2nd edition, prepared by FMHACA, June 2012.

- FMHACA decide whether a medicine is safe enough when used without prescription.

- Though legally classified as OTC (no prescription is required), still have some risks.
 - Some interact with other medicines, supplements, foods or drinks.
 - Others cause problems for people with certain medical conditions.
- Therefore it has to be dispensed by pharmacy personnel with
 - a sufficient counseling about the condition/medications
 - maximum quantity dispensed at one time should be determined.
- As a general rule, OTC have to be used primarily to treat a condition that does not require the direct supervision of a doctor and they are proving to be reasonably safe and well-tolerated.

NB: For lists of OTC drugs see **annex-1**

Self-Check

Match the following drugs with their appropriate storage conditions

A

1. Flammable liquids
2. Corrosive
3. Controlled drugs
4. Biologicals

B

- A. Refrigerator
- B. Secured storage conditions
- C. Steel cabinet
- D. Special or separate rooms
- E. Main store on shelf

Short answer questions

1. List components of dispensing environment.
2. List the role of personal protecting equipment.
3. Which stock rotation system is used for medical supplies that have no expiry date?
4. What is the basis for drug arrangement as therapeutic classes?
5. How drug arranged by alphabetic order?

Summary

- Dispensing area is a place that have basic space and equipment needed for dispensing medication. The facility and equipment in dispensing area include
 - a dispensing table to work on,
 - proper storage areas
 - designated refrigerators
 - areas for dispensing medications.

- Appropriate personal protective equipments are available for safe dispensing.
- Pharmaceuticals are organized in dispensary that enable FEFO or FIFO stock rotations.
- Dispensing units have a system for classifying or organizing medicines that ensure all employees know the system being used. Major drug arrangement in dispensary:
 - Therapeutic classes
 - Alphabetical order by generic name
 - Dosage form of final preparation
- In dispensing room storage conditions can be arranged in two classes:
 - ❖ Normal storage conditions
 - ❖ Special storage conditions
 - Cold storage conditions
 - Combustible /flammable
 - Secured storage
- Based on legal factors drugs are classified into three legal classes.
 - Prescription only drugs that cannot dispensed without a prescription.
 - Controlled drugs that require prescription and additional safeguards for storage
 - OTC drugs that do not require a prescription.

Skill Practice Session 8: Arrangement of medicines based on their storage conditions**Practice/demonstrate Arrangement of medicines in dispensary based on their storage conditions****Purpose:**

- The purpose of this activity is to enable you to practice those skills necessary to arrange drugs in dispensary based good storage practice.

Instructions: Dear Trainee, arrange the given medicines according to their storage conditions as normal, cold, combustible/flammable and secured storage conditions, also discuss the pharmacology class of these medicines

Oxytocin, Amoxicillin, Omeprazole, Ketamine, Suxamethonium, Pethidine, Diazepam, Sodium valproate, Ergometrine, Tramadol, Diclofenac, Alcohol, Formaldehyde, Hydrogen peroxide, Imipramine

Normal storage conditions	Cold storage conditions	Combustible/flammable storage conditions	Secured storage conditions

Skill Practice Session 9: Arrangement of medicines as Prescription only medicines (POM), Over the counter (OTC) and controlled medicines

Purpose: To enable you to practice those skills necessary to arrange drugs based on the prescription according to the legal requirements.

Instructions: Dear trainees arrange the given medicines as prescription only medicines (POM), Over the counter (OTC) and controlled medicines and also discuss the pharmacology class of these medicines.

Pethidine, Paracetamol, Antacid oral suspension, Hydrocortisone, Phenobarbitone, Dextromethorphan hydrobromide, Ibuprofen, Multivitamin preparations, Iodized salt, Gentian violet, Gentamicin, Medroxyprogesterone acetate, Condom, Ketoconazole, Artisanate, Artemether + Lumfantrine, Metronidazole, Nitroglycerine, Captopril, Glibenclamide

Prescription only medicines (POM)	Over the counter (OTC)	Controlled medicines

2. Prescription and Abbreviations in prescription writing

Objective

At the end of the chapter you are able to

- Define prescription
- List parts of prescription
- Identify type of prescription
- List commonly used pharmaceutical abbreviation in prescription writing

2.1 Introduction to prescription

Prescription' means any order for medicines written by a duly licensed medical practitioner issued to a patient in order to collect medicine from dispensing unit" (FMHACA Proclamation No. 661/2009). Prescriptions designate specific medications and dosages to be administered to a particular patient at a specified time.

A. Types of prescription

Based on the type of preparation prescribed, prescription is classified into two types.

1. **Prescription for pre-compounded medication**, it is a type of prescription for already prepared drug by pharmaceutical companies
2. **Prescription for extemporaneous preparation** in this prescription the pharmacists prepare the medication according to the drugs and dosages directed by the physician.

Based on the nature of the drugs prescribed, prescription is also classified into two types.

1. **Ordinary prescription:** this type of prescription used for all drugs except narcotic and psychotropic substances, can be prescribed by nurses, physicians, health officers, dentists, psychiatrists and useful for OTC and prescription only medicines prescribing.
2. **Special prescription:** it is used for narcotic and psychotropic drugs and prescribed by specialized professionals. The drugs prescribed on this prescription need special counselling and drugs cannot be OTC in any level of knowledge.

B. Parts of prescription

The written prescription has stringent requirements designed to inform pharmacy personnel and protect the patient. Prescription regulations vary from state to state and province to province, but generally a prescription for a health facility will contain the information illustrated below.

PRESCRIPTION PAPER

Serial No _____

Area Code _____

Patient Address (Information) {

Institution Name: _____ **Tel. No.** _____

Patient's Full Name: _____

Sex: ____ **Age:** ____ **Weight:** ____ **Card No.** _____

Region: _____ **Town** _____ **Woreda** _____ **Kebele** _____

House No. ____ **Tel. No:** _____ ☐ Inpatient ☐ Outpatient

Diagnosis, if not ICD _____

Medicine Name, Strength, Dosage Form, Dose, Frequency, Duration, Quantity, How to use & other information		Price (dispensers use only)
Superscription	Rx	
Inscription	Amoxicillin 250 mg capsule	
Transcription	TID, PO for seven days	
Subscription	# 21 capsules	
Refill instructions	Refill _____	
Generic substitution instructions (optional)	Dispense as Written _____	
Total Prices		

Prescriber's**Dispenser's****Full name** _____

Qualification _____

Registration # _____

Signature _____

Date: _____

Figure 2-1: Parts of Standard Prescription Paper

1. Serial number

- FMHACA recommended that prescription paper shall have a serial number with area code as shown on the top of the prescription paper above.
- 14H000000 is a serial number given to Private, Governmental and Non-Governmental health institutions where **14H** is code for these health institutions and **000000** is a consecutive serial numbers of prescriptions for a given health institution.

2. Name and address of the health institution

- The name of the health institution
- The address of the health institution
 - ❖ Telephone number , Region, Kebele, Woreda, House number, P.O.Box

3. Patient information

- Full name of the patient
- Age and sex of the patient
- Card number
- Address of the patient
 - 📍 Telephone number, Region, Town, Kebele, Woreda, House number
- Type of patient: Outpatient or Inpatient
 - ✓ The name, address, age and sex of the patient help in identifying the prescription
 - ✓ The prescribed medication is only for the patient whose name is on the prescription.
 - ✓ Weight, age and sex of the patient are important in verifying the correct patient and/or dosing of the medication.

4. Type of diagnosis

- ★ Diagnosis is the identification of the nature and cause of a disease.
- ★ The type of diagnosis can be written on a prescription paper either on words or codes referred to as diagnostic codes.
- ★ In healthcare, diagnostic codes are used to group and identify diseases, disorders, symptoms, human response patterns, and medical signs, and are used to measure morbidity and mortality.

- The International Statistical Classification of Diseases and Related Health Problems (most commonly known by the abbreviation ICD)
- A medical classification that provides codes to classify diseases and a wide variety of signs, symptoms, abnormal findings, complaints, social circumstances & external causes of injury or disease.
- Under this system, every health condition can be assigned to a unique category and given a code, up to six characters long.
- Most ICD-9 codes are comprised of three characters to the left of a decimal point, and one or two digits to the right of the decimal point.
 - ❖ 250.0 means diabetes with no complications
 - ❖ 530.81 means gastro reflux disease (GERD)
 - ❖ 079.99 means a virus disease

5. Superscription

- The 'Rx' symbol is called the superscription is used as an abbreviation of the Latin word recipe, which means, “Take thou” or “you take”
- Rx symbol comes before the inscription, the sign at the foot of the letter R is believed to represent the sign of Jupiter, the God of Healing

6. Inscription

- The inscription comprises an important part of prescription containing
 - ✓ Name(s) and strength of drug(s)
 - ✓ Instruction regarding dosage form like tablet, capsule, suspension, mixture, etc.

7. Subscription

- Gives specific directions for the pharmacist on how to compound the medication.
- Most of direction is usually expressed in contracted Latin or in the form of abbreviation.
- Consists of directions given to the pharmacist with respect to the dosage form and the number of dosage units/quantity to be supplied.
- Instructions for preparation are also given such as '**make a mixture**', '**mix** and make 10 tablets', or '**dispense 10 capsules**'.

8. Transcription or Signatura

- Signatura refers to the **directions given** by the **prescribers to the patient**.
- In this portion, the physician indicates to the patient:
 - how he/she should take the prescribed medicine/s.
 - directions are usually written using abbreviated forms of Latin.
 - instructions are preceded by abbreviation '**Sig.**' from the Latin, meaning 'mark' indicates how, how much, when, and how long the drug is to be taken.
 - e.g., 1 cap tid po means take one capsule thrice a day orally.

In the best interest of the patient, it is advisable that no abbreviations be used. The prescriber should preferably write the dosage schedule in simple, unambiguous terms that the patient or his representative/caretaker can read and understand.

- e.g., 'take 1 teaspoonful three times a day (every eight hours) after meals.'

If the patient is illiterate, the physician may use pictorial representations to make the patient understand the dosage properly. If the physician does not write the instructions in layman's terms, it is the responsibility of the pharmacist to explain the dosage to the client/patient in simple terms.

9. Refill information

In certain cases, a single course of therapy may not be sufficient for effective treatment of the patient. Under such circumstances, the physician may decide to repeat the course of therapy, and indicate the same on the prescription. This information is called **refill information**. The refill information should indicate the number of times the prescription should be refilled and the intervals after which it should be refilled. Refill information aids in preventing a person from having his/her prescription filled more often than the proper dosage regimen warrants, and other patients from using the prescription for a similar condition, or misusing it.

Example: –

Benzodiazepines are ideally prescribed for short-term therapy for a maximum of two or three weeks. A physician may therefore write a prescription for say, 10 days, with no refilling instructions. The pharmacist must ensure that such a prescription is not refilled, unless specified by the doctor, as it can lead to the patient getting habituated to the use of medicines prescribed.

10. Prescriber/dispenser information

- Prescriber/dispenser information include:
- Full Name of professional
- Qualification
- Registration number
- Signature; signature of the prescriber/dispenser in his own handwriting.

11. Prescription Date

- Should be written on the top of the prescription paper and/or below the signature of the prescriber. The date also essential to mark the legality of the prescription.

2.2 Common abbreviations in prescription writing

Many medical and pharmaceutical terms are abbreviated for ease of communication and record notation. It has been estimated that about 10,000 abbreviations are used in the health sciences. Many abbreviations are specific for one institution or one area of the country. It is also possible that one abbreviation may have more than one meaning.

Abbreviations are regularly used in the pharmacy to communicate essential information such as the dosage form, dosage regimen, and route of administration. To be safe and efficient, technicians must memorize these commonly used abbreviations and understand their meaning.

Table 2-1: **Latin Terms and Abbreviations used in prescription writing**

1. Abbreviation for Dosage forms

Abbreviations	Latin Name	English meaning
caps.	Capsula	A capsule
cataplasm	Cataplasma	A poultice
chart	Charta	A powder
collun	Collunarium	A nose wash
collut	Collutorium	A mouth wash
collyr	Collyrium	An eye lotion
crem	Cremor	A cream
emp	Emplastrum	A plaster
emul	Emulsio	An emulsion
garg	Gargarisma	A gargle

gelat	Gelatina	A jelly
gtt	Guttae	Drops
Inhal/vap	Inhalatio/vapor	An inhalation
inj	Injectio	An injection
insuff	Insufflatio	An insufflation
linct	Linctus	A linctus
lin	Linimentum	A liniment
liq	Liquor	A solution
lot	Lotio	A lotion
m., mist	Mistura	A mixture
narist	Naristillae	Nasal drops
neb	Nebula	A spray solution
oblat	Oblatum	A cachet
oculent	Oculentum	An eye ointment
past	Pasta	A paste
pastill	Pastillus	A pastille
pess	Pessus	A pessary
pigm	Pigmentum	A paint
pil	Pilula	A pill
pulv	Pulvis	A powder/ dusting
solv	Solvellae	Solution tablets
sternut	Sternutamentum	A snuff
suppos	Suppositorium	A suppository
tab	Tabella	A tablet
troch	Trochiscus	A lozenge
ung	Unguentum	An ointment
vitrell	Vitrella	A crushable glass capsule

2. Instructions Relating To Preparation

Abbreviation	Latin Name	English meaning
add	Adde, Addatur	Add. Let (it) be added
calef	Calefac, Calefiat	Warm. Let (it) be warmed
div. in pt aeq	Dividatur in partes aequales	Divide into equal parts
div	Divide, Dividatur	Divide, Let (it) be divided
ft	Fiat / Fiant	Let (it) be made
m	Misce, Misceatur	Mix. Let (it) be mixed

3. Quantity To Be Sent and Manner of Sending

Abbreviation	Latin Name	English meaning
duplum	Duplum	Twice the quantity
mitt	Mitte	Send
p.p.a	Phiala prius agitata	The bottle being first shaken(attach, shake the bottle label)
qt.dx	Quantitas ,duplex	Twice the quantity
tal.	Talis, Tales, Talia	Such

4. Method of Administration or Application

Abbreviation	Latin Name	English meaning
addend	Addendus	To be added
applicand	Applicandus	To be applied
applicat	Applicetur	Let (it) be applied
capiend	Capiendus	To be taken
d.	Da	Give
dand.	Dandus	To be given
deglut	Deglutiendus	To be swallowed
infricand	Infricandus	To be rubbed in
infric	Infricetur	Let (it) be rubbed in
inhal	Inhaletur	Let(it) be inhaled

instilland	Instillandus	To be dropped in
miscend	Miscendus	To be mixed
sig.	Signa	Label
sugend	Sugendus	To be sucked
s. or sum.	Sumendus	To be taken
u.a.	Ut antea	As before

5. Time of Administration or Application

Abbreviation	Latin Name	English meaning
ad 3 vic.	Ad tres vices	For three times
alt. hor	Alternis horis	Every two hours
a.c.	Anti cibos./cibum	Before meals/food
b.i.d, b.d	Bis in die. or bis die	Twice a day
b.t.i.d	Bis terve in die	Two or three times a day
hac noct.	Hac nocte	Tonight
h.s. / h.d.	Hora somni / Hora decubitus	At bed time
i.c.	Inter cibos/cibum	Between meals/food
inter. noct	Inter noctem	During the night
m.	Mane	In the morning
m.seq.	Mane sequenti	The following morning
noct. /n.	Nocte	At night
n. et m/n.m.	Nocte et mane/Nocte maneque	Night and morning
od	Omne in die	Every day/once daily
o.h. qq.h.	Omni hora. ,Quaque hora	Every hour
o.m.	Omni mane	Every morning
o.n.	Omni nocte	Every night
o.p.d	Omni per die	Once per day

o.q.h	Omni quarta hora	Every fourth hour
p.c.	Post cibos. /cibum	After meals/food
p.m.	Post meridiem	Evening or afternoon
prim. luc / prim. m	Prima luce / Primo mane	Early in the morning
PRN, prn	Pro re nata	As needed
q.a.d./q.o.d	Quaque alternis die/ omni die	Every other day
q.a.m.	Quaque die ante meridiem	Every day before noon
q.p.m.	Quaque die post meridiem	Every day after noon or every evening
q.h.	Quaque hora	Every hour
q.h.s.	Quaque hora somni	Every night at bedtime
qq.q.h	Quaque quarta hora	Every fourth hour
q.i.d or q.d.	Quarter in die. /quarter die	Four times a day
quart. hor	Quartis horis	Every four hours
q.d.s.	Quater die sumendus	Four times a day
quot (qd)	Quotidie	Daily or every day
sec. hor	Secundis horis	Every two hours
sem. in die	Semel in die. or semel die	Once a day
sex. in d. /sex.d.	Sexies in die. /sexies die	Six times a day
sext. hor	Sextis horis	Every six hours
sing. hor.	Singulis horis	Every hour
t.i.d/t.d	Ter in die. or ter die	Thrice a day

t. in hebdom/ t.i.w.	Ter in hebdomada	Three times a week
t.q.d	Ter quaterve die	Three or four times a day
tert. hor	Tertiis horis	Every three hours
vesp.	Vespere	In the evening

6. Part of the Body to which Drug is Applied

Abbreviation	Latin Name	English meaning
auri	Auri / auribus	To the ear, for the ear
a.d.	Auris dextra	Right ear
a.l., a.s.	Auris laeva, auris sinistra	Left ear
a.u.	Auris utraque	Both ears
dext.	Dexter	Right
dolent.part	Dolente parti ,dolentibus partibus	To the afflicted part
gutt.	Gutturi	To the throat
in aur.sinist	In aurem sinistram	Into the left ear
in ocul.dext	In oculun dextrum	Into the right eye
in. sing.aur	In singulas aures	Into each ear
NPO	Nil per os	Nothing by mouth
ocul	Oculis/ oculo	For the eyes
o.d/OD	Oculus dexter	Right eye
o.s./OS	Oculus sinister	Left eye
o.u.	Oculus uterque	Both eyes
p.a.	Parti affectae	To the affected part
p.a.a.	Parti affectae applicandus	To be applied to the affected part
p.a.	Partibus affectis	To the affected parts
p.r. or PR	Per rectum	By rectum
PV	Per vaginam	Via the vagina
pro capill	Pro capillis	For the hair

pro ocul	Pro oculis	For the eyes
pro ocul laev	Pro oculo laevo	For the left eye
pro sing.ocul	Pro singulis oculis	For each eye
sinist	Sinister	Left
dol. urg.	Dolore urgente	When the pain is severe
freq.	Frequenter	Frequently
m.d.	More dicto / Modo dicto	As directed
quot.o.s	Qouties opus sit	As often as necessary
si dol. urg	Si dolor urgeat	If the pain is severe
sos	Si opus sit	When required, when necessary

Self-Check

Match the following parts of prescription given under column 'A' with their description given under column 'B'.

A

1. Superscription
2. Inscription
3. Subscription
4. Transcription
5. Dispense as written

B

- A. Direction for pharmacist on how to compound drugs
- B. Contain name, strength of drug and dosage form
- C. You take
- D. Generic substitution directions
- E. Directions given by the prescribers to the patient
- F. Address of patients
- G. Diagnosis information

Short answer Questions

1. Write the equivalent meaning for the following abbreviations in English

- | | |
|--------|--------|
| a. QID | e. OD |
| b. BID | f. PO |
| c. TID | g. NPO |
| d. PRN | h. QOD |

Summary

A prescription is a written order from a practitioner for the preparation and administration of a medicine or a device.

Prescription has the following parts

- Serial number
- Name and address of the health institution
- Patient information
- Type of diagnosis
- Superscription
- Inscription
- Subscription
- Transcription
- Refill information
- Prescriber/dispenser information
- Prescription Date

Abbreviations are regularly used in the pharmacy to communicate essential information such as the dosage form, dosage regimen, and route of administration. To be safe and efficient, pharmacy professional must memorize the most commonly used abbreviations with their meaning.

Skill Practice Session 10: Interpretation of abbreviations used in prescription**Purpose:**

- To enable you to practice those skills necessary to interpret abbreviations in prescription paper according to the legal requirements.

Instructions:

Dear trainees, based on the given prescribed medicine interpret the abbreviations in the prescription paper.

**.GIMBI GENERAL HOSPITAL
PRESCRIPTION PAPER**

Tel:+25157771914/15/16

P.O.Box: 286

Patient's Full Name: G T

Age: 20 Sex: M Weight: 50 kg MRN: 0000xxxx

Region: Oromia Zone: W/Wollega Woreda/Town: Bube Kebele: 01

House No. New Tel. No: New Outpatient: ☐ Inpatient: ☐

Specific diagnosis, if not ICD: Gastritis + Depression

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Omeprazole 20mg cap, PO, P.C, BID for 15 days	
- Amitriptyline 25mg Tab, po/day h.s. for 1 month	
- Paracetamol 1g Tab, po, PRN = 10tabs	
Total Price	

Prescriber's

Full Name: AY

Qualification: MD

Registration No: XXXX

Signature: Signed

Date: 22/03/2010 E.C.

Dispenser's

DD

Pharmacist

YYYY

Signed

22/03/2010 E.C.

Skill Practice Session 11: Interpretation of abbreviations used in prescription**Purpose:**

- To enable you to practice those skills necessary to interpret abbreviations in prescription paper according to the legal requirements.

Instructions:

Dear trainees, based on the given prescribed medicine interpret the abbreviations in the prescription paper.

BISHOFTU HEALTH CENTER**PRESCRIPTION PAPER****Tel:+251xxxxxxx****P.O.Box: xyz**Patient's Full Name: YTAge: 18 Sex: F Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: OSZ Woreda/Town: Bishoftu Kebele: 04House No. New Tel. No: New Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD: Pneumonia**

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Penicillin G, Crystalline 3 MIU IV QID for 5 days	
- Paracetamol 1g tab po PRN=10 Tab	
Total Price	

Prescriber'sFull Name: AYQualification: MDRegistration No: XXXXSignature: SignedDate: 22/03/2010 E.C.**Dispenser's**DDPharmacistYYYYSigned22/03/2010 E.C.

3. Computer and Medication information in pharmacy

Objective

After completing of this chapter you are able to

- List role of computer in medication dispensing
- Identify sources of medicine information

3.1 Computer systems in pharmacy

Pharmacies use computerized tools that help productivity and maintain dispensary information.

Computerized pharmacy management systems perform the following:

- ✚ label printing
 - ✚ stock reordering
 - ✚ perform product inventory
 - ✚ medicine pricing or billing
 - ✚ essential information within easy access.
- As a result, professionals dispense more prescriptions and information than ever before.

In Health Commodity Management Information System (HCMIS) computers used to check

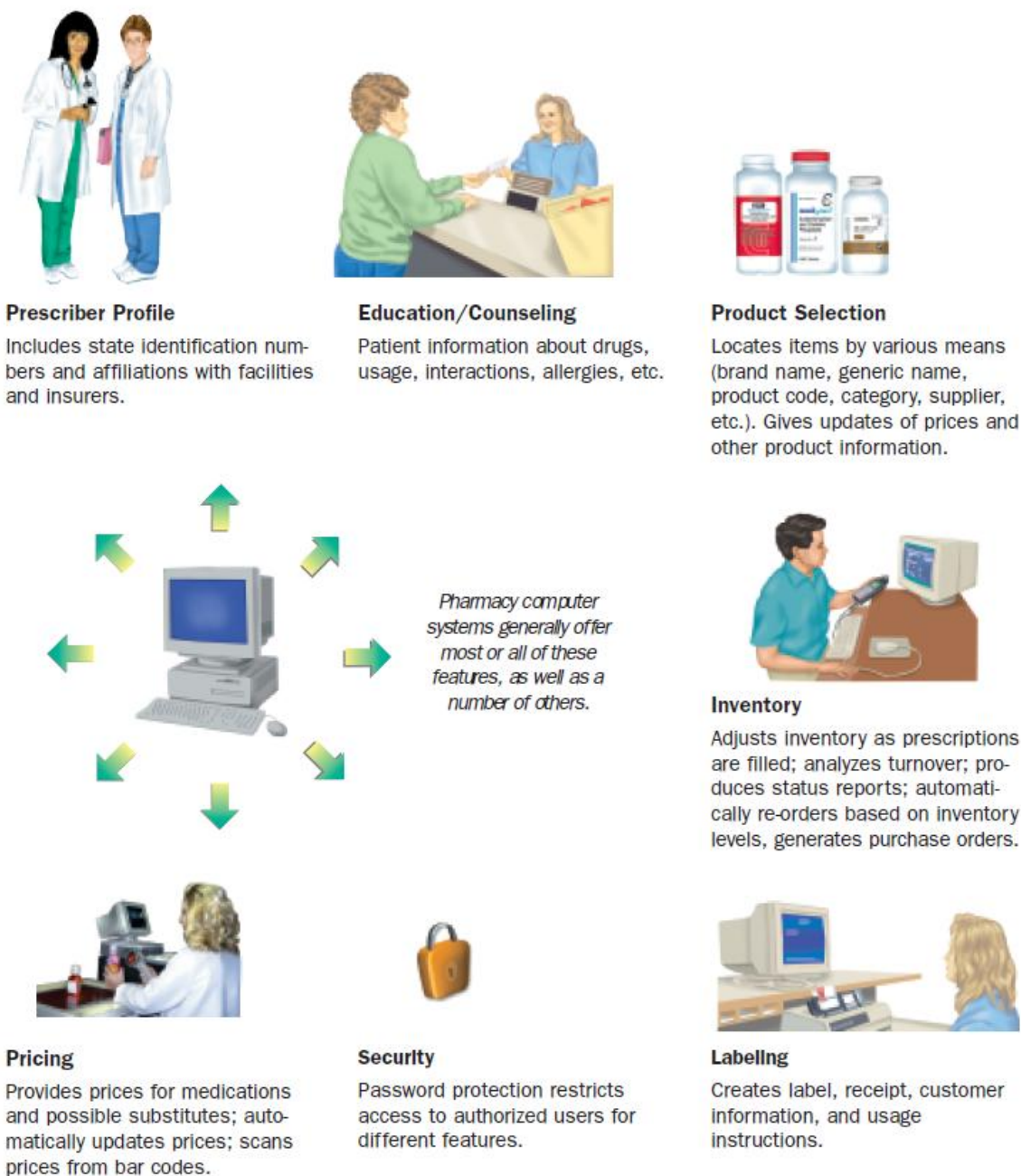
- stock status (availability of medicines)
- near expiration,
- overstocked or stock out
- consumption trend,
- consumption by unit,
- loss/adjustment cost of medicines and
- calculating average monthly consumption.

Although each pharmacy computer system has its own specific features, many general principles of computer usage apply to all systems. The most important element is stated in the classic computer axiom: **garbage in, garbage out**, i.e. the information produced by the computer is only as good as the information that is entered into it. Special care has to be taken when entering information (data) to make sure it is correct. A simple mistake in data entry can result in the wrong medication being given to the wrong patient or any number of other serious problems.

Role of computer in pharmacy

- Update dispensary system information as required
- Back up dispensary system information to ensure secure data
- Enables changes to data stored in dispensary information system
- Maintain confidentiality of dispensary information

Figure 6-1: **Function of Computers in pharmacy**



3.2 Medication information in dispensary

Information about medicines is rapidly expanding because of

- new medicine products entering into the markets
- new information about medicines in use.
- Pharmacy professional have to up-to-date his/her medicine information in order to provide information to
 - Patients/clients
 - other health care professionals
 - a general public
- Pharmacy professionals particularly are in close working relationships with prescribers, where they can give advice in the following areas:
 - Medicine choice, e.g. during pregnancy, breast feeding, etc.
 - Dose interval and regimen
 - Route of administration
 - Adverse drug reactions
 - Medicine interactions (drug-drug, medicine-diet, medicine-disease interactions)
 - Duration of therapy, formulations, storage and cost of medication
 - Promote rational medication therapy
- Patients or care providers require information on prescription or OTC drugs in areas:
 - Type of medicine and how it works
 - Amount to be taken
 - Frequency of administration
 - Duration of therapy
 - Side effects and precautions
 - Storage condition

3.3 Sources of medicine information

Although basic information about medicines is obtained through training in pharmacy profession, additional knowledge can be gained from various sources. These sources of medicine information can be classified into primary, secondary and tertiary.

1. **Primary sources**

Provide new medicine information mainly based on research in journals.

- Such sources include health journals
 - Ethiopian pharmaceutical Journal
 - Ethiopian Medical Journal
 - Ethiopian Journal of Health Development
- It is important to assess the reputability of the journal and time of publication.

2. **Secondary sources**

Provide reviews of articles that appear in primary sources

Examples include

- ✚ medicine information bulletins
- ✚ adverse medicine reaction bulletin
- ✚ hospital formularies
- ✚ standard treatment guidelines etc.

3. **Tertiary sources**

- Include standard reference books such as
 - British National Formulary
 - Basic and clinical pharmacology
 - Dispensing for pharmaceutical students
 - Medical dictionary, etc.

The selection of a particular source of information depends on the type of information required. Tertiary sources are used first than secondary or primary sources as they provide a broad overview of particular subject area. Standard books are published at longer time intervals than journals.

Medicine information inquiries that are beyond the ability of medicine dispensers can be referred to the nearest medicine information centers (DICs). The main aim of these centers is to provide accurate and precise medicine information for health professionals and the general public. Medicine information supplied by the pharmaceutical industries either in the form of leaflets in the packages or via their representatives is being used by many clients. Health professionals should develop critical attitudes towards information provided by pharmaceutical industry as their information may be biased.

Self-Check

Choose the best answer from the given alternative for the following questions.

- Which one of the following sources of drug information is classified under primary sources?
 - Ethiopian pharmaceutical Journal
 - Hospital formularies
 - Medical dictionary
 - Standard treatment guidelines
- On which of the following area patient needs drug information from pharmacy professions?
 - Amount to be taken
 - Frequency of administration
 - Duration of therapy
 - All of the above

Summary

Computer applications for pharmaceutical management

Area of activity

Uses

Selection	Preparation of essential medicines lists and literature searches
Procurement	Preparing purchase orders and receiving reports
Inventory control	Monitoring of stock positions, expiry dates and invoicing
Registration and control	Adverse reaction reporting and medicines recalls
Medicines information	Formulary preparation, literature searches, pharmaceutical bulletin production, training material preparation
Rational use	Formulary, standard treatment schedule, calculation of WHO medicine-use indicators and training (simulation games)

Prescribers, dispensers, and users of medicines all require information on medicines. The sources of this information can be classified as primary (articles or papers on original research), secondary (reviews of the primary literature), and tertiary (textbooks or pharmaceutical product information approved by drug regulatory agencies).

4. Selling products and customer services

After the end of this chapter you will be able to

-  List good customer services
-  Explain selling techniques
-  Elaborate patient counseling element in medication dispensing
-  Describe principles of client-centered healthcare

Good customer service requires presenting customer in a calm, courteous & professional manner.

- requires listening to customers
- understanding customer requests for service
- fulfilling those requests accurately or
- explaining to the customer's why the request cannot be serviced.

Customers may often feel sick or irritable and need their medication quickly. Having to wait in a line may be physically difficult or emotionally upsetting. The cost of the medication may be an additional worry. Consequently, good customer service is an important in any type of retail pharmacy that increase patient comfort.

It is important to respond to customers in a positive way at all times. In any situation where a customer is angry, frustrated, or otherwise dissatisfied, it is important to give a positive response. This can be done by listening intently and making eye contact with customer. Restating what the customer has said is also important, since it demonstrates that you have listened to their complaint.

Use positive, not negative, terms to tell the customer what you can do, not what you can't do to solve their problem. Involve the pharmacist in all difficult situations. If after spending some time with the customer, you have been unable to resolve the problem, you should inform the pharmacist. This should be done immediately for serious complaints regarding problems with prescriptions. Remember that employees who possess well-developed interpersonal skills are good for business and will be appreciated by employers.

Selling products and services is like an endless cycle: you need to learn all about the products and services your organization offers, and you need to approach customers with confidence and find out what their specific needs are. Once you know what they are looking for you can then, using your product knowledge, recommend products and services that match their needs and handle any objections that might arise before, closing the sale.

4.1 Client-centered healthcare

The workplace is an important setting for health protection, health promotion and disease prevention programs. While employers have a responsibility to provide a safe and hazard-free workplace, they also have abundant opportunities to promote individual health and foster a healthy work environment for many workers. A healthy workplace is one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and well-being of patients, workers and sustainability of the workplace.

- health and safety concerns in the physical work environment;
- health, safety and well-being concerns in psychosocial work environment
- personal health resources in the workplace and
- participating in community to improve health of workers & members of community.

Principles of client-centered healthcare

- innovative approach to the planning, delivery, and evaluation of health care
- grounded in mutually beneficial partnerships (health care providers, patients & families).
- applies to patients of all ages
- practiced in any health care setting.

Concepts of patient-centered care

There are numerous proposed definitions of patient-centered care that encompass many of the same core concepts, but there is no globally accepted definition. Modern concepts of patient-centered care are based largely on research conducted in 1993 by the Picker Institute, in conjunction with the Harvard School of Medicine. This research identified eight dimensions of patient-centered care that were originally documented in the book, ‘Through the Patient’s Eyes: Understanding and **Promoting Patient-Centered Care** dimensions’.

- respect for patients’ preferences and values
- emotional support
- physical comfort
- information, communication and education
- continuity and transition
- coordination of care
- involvement of family and friends
- access to care.

Several terms are used interchangeably or associated with ‘patient-centered care.

1. Consumer-centered care

The term ‘consumer-centered care’ is sometimes preferred to ‘patient-centered care’ to acknowledge that care should focus on people who are actual or potential users of healthcare services. The term ‘patient’ has passive overtones. In contrast, the term ‘consumer’ is seen as a more active term, encompassing the need to engage people as partners in health service delivery.

2. Person-centered care

The term ‘patient-centered healthcare’ is often used interchangeably in primary care settings with terms such as ‘person-centered care’, ‘relationship-centered care’ and ‘personalized care’. Applied to older people and focuses on developing relationships and plans of care collaboratively between staff and patients. This term values the needs of patients, careers and staff. ‘Personalized care’ is the integrated practice of medicine and patient care based on one’s unique biology, behavior and environment. It uses genomics & molecular-level techniques in clinical care; as well as health information technology, to integrate clinical care with individualized treatment of patients.

3. Family-centered care

This term emerged in the US in the 1980s in response to the needs of families with children who could not leave hospital. These families sought to work more collaboratively with healthcare professionals and successfully advocated for changes to enable them to care for their children in home and community settings.

Advantages of patient-centered care

- Experience, clinical and operational benefits.
- healthcare administrators, providers, patients and families work in partnership
 - ❖ decrease cost, quality and safety of health care rises and
 - ❖ provider and patient satisfaction increase
- Decreased mortality, decreased emergency department return visits
- Fewer medication errors & lower infection rates
- Higher functional status, improved clinical care
- In chronic conditions can improve disease management
 - increase both patient and doctor satisfaction
 - increase patient engagement and task orientation
 - reduce anxiety; and improve quality of life.

In short person centred care can have a big impact on the quality of care

- ❖ improve the experience people have of care and help them feel more satisfied
- ❖ encourage people to lead a more healthy lifestyle , such as exercising or eating healthily
- ❖ encourage people to be more involved in decisions about their care so they get services and support that are appropriate for their needs
- ❖ improve how confident and satisfied professionals feel about the care provided

4. Principles of client safety

Patient safety is a discipline in the health care sector that applies safety science methods toward the goal of achieving a trustworthy system of health care delivery. Patient safety is also an attribute of health care systems; it minimizes the incidence and impact of adverse events, and maximizes recovery from, adverse events. Patient Safety is prevention of harm to patients. Emphasis is placed on the system of care delivery that

- prevents errors
- learns from the errors that do occur; and
- built on a culture of safety of health care professionals, organizations, and patients

Many patient safety practices in dispensing units like use of bar coding and computerized dispensing entry, have been considered as possible strategies to avoid patient safety errors and improve health care processes.

4.2 Patient counselling in dispensary

Communication skills are very important for dispensers dealing with patients or health care professionals to convey relevant medicine information effectively and clearly, which can be done verbally and/or in written form. Medicine dispensers must have the ability to explain information clearly by the language the patient or care provider can understand and check whether the information is being understood.

Communication is the art and process of creating and sharing ideas, i.e. transfer of information meaningful to those involved. Effective communication depends on the richness of those ideas.

Communication process between health professionals and patients serves two functions:

1. Establishes an ongoing relationship between the professional and the patient.
2. Provides exchange of information necessary to assess a patient's health condition, and evaluate the effects of treatment on a patient's quality of life.

Communication skills are tools used to remove the barriers to effective communication.

- The healthcare professional must be able to
 - ✓ understand the illness experience of the patient
 - ✓ perceive each patient's experience as unique
 - ✓ foster a more egalitarian relationship with patients
 - ✓ build a therapeutic alliance with patients to meet mutually understood goals of therapy
 - ✓ develop self-awareness of personal effects on patients
- Patients encouraged to share experiences with therapy because patients :
 - have unanswered questions
 - have misunderstandings
 - experience problems to therapy
 - can monitor their own responses to treatment
 - make their own decisions regarding therapy
 - may not reveal information to you unless you initiate a dialogue

Communication during drug therapy

- Purpose of medication
- How medication works
- Dose and duration of therapy
- Goals of therapy
- How effectiveness will be monitored
- Adverse effects and how to deal with them
- Drug specific issues

Dissemination of medicine information to health care professionals, patients and the general public is an important responsibility of pharmacy professionals by both verbal & written communication.

- Verbal communication to medicine information must be:
 - Clear and fluent by understandable language
 - Well-organized on important details
 - With confidence done by maintaining eye contact during face-to-face communication
 - Avoid; emotion, negligence, medical languages and unnecessary details.
- Written communication of medicine information for patients must be well-organized, readable, clear and complete.

Self-Check

True false questions

1. Communication is important in dispensing medication.
2. Communication is not necessary in counseling.
3. You should expect the same behavior from all of your customers.
4. Quality medicine dispensing is the heart for improving customer services.

Short answer questions

1. List the terms that are used interchangeably or associated with patient-centered care.
2. List two patient safety practices in dispensing units that avoid patient safety errors.
3. List component of patient-centered healthcare.

Summary

Good customer service requires presenting yourself to customers in a calm, courteous, and professional manner. Listening to and understanding customer requests for service and explaining to the customer's satisfaction why the request cannot be serviced is important.

Quality medication dispensing is the heart for improving customer services. Communication skill improve quality dispensing and must be followed by all dispensers.

Workplace is an important setting for health protection, health promotion and disease prevention programs. While employers have a responsibility to provide a safe and hazard-free workplace, they also have abundant opportunities to promote individual health and foster a healthy work environment for many workers.

5. Principles and processes of good dispensing practice

After completing this chapter you are expected to

-  Describe principles of good dispensing practices in pharmacy dispensary
-  Identify types and parts of prescription
-  Classify pharmaceutical products based on legal requirements
-  List commonly used pharmaceutical abbreviations with their translation
-  Perform medication dispensing process accurately

5.1 Principles of Good Dispensing

Good dispensing practice refers to the process of preparing medicines and distributing to users with provision of an appropriate information, counseling and follow up.

The rational use of medicine requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community. Rational use of medicines is a complex issue demanding mainly an integrated action of prescribers, dispensers and users and/or patients.

It may extend to the level of health administrators and policy makers, for instance, in matters related to the development of a list of essential medicines and improvement of the availability of medicine. Dispensing practice plays a central role in the provision of rational medicine use. Medicine should be dispensed in a safe & hygienic manner, making sure that the patient or care provider understands the value of taking specific medicines for specific indications.

- Good dispensing practice ensures the correct medicine is delivered
 - ★ to the right patient with clear instructions,
 - ★ in the required dosage and quantities,
 - ★ in package that maintains acceptable potency and quality of medicine.

The dispensing process includes all activities that occur between the time the prescription or request for medicine is presented up to the time the medicines or other prescribed items are issued to the patient. This process may take place in health institutions and community medicines retail outlets. It is often carried out by pharmacy professionals. Any error or failure in the dispensing process can seriously affect the care of the patient mainly with medical and economical consequences. Therefore, the dispenser plays a crucial role in the therapeutic process.

5.2 Dispensing process

The consistent, repeated use of good dispensing procedures is vital in ensuring that errors are detected & corrected at all stages of the dispensing process. The term dispensing process covers all activities involved, from receiving prescription to issuing prescribed medicine to patient. Good dispensing practice is a process that requires knowledge, skill and attitude which is important for delivery of correct drug and medical supply to the package that maintains acceptable potency and quality with clearly and up to date information using clean equipment and working area according to medication order or request.

The development and use of written standard operating procedures (SOPs) for the dispensing process will improve consistency and quality of work. The framework for such SOPs is based on the **major areas of activity** which is called dispensing cycle. In general there are **six major steps** to be performed in the dispensing cycle during the dispensing process for ambulatory patients.

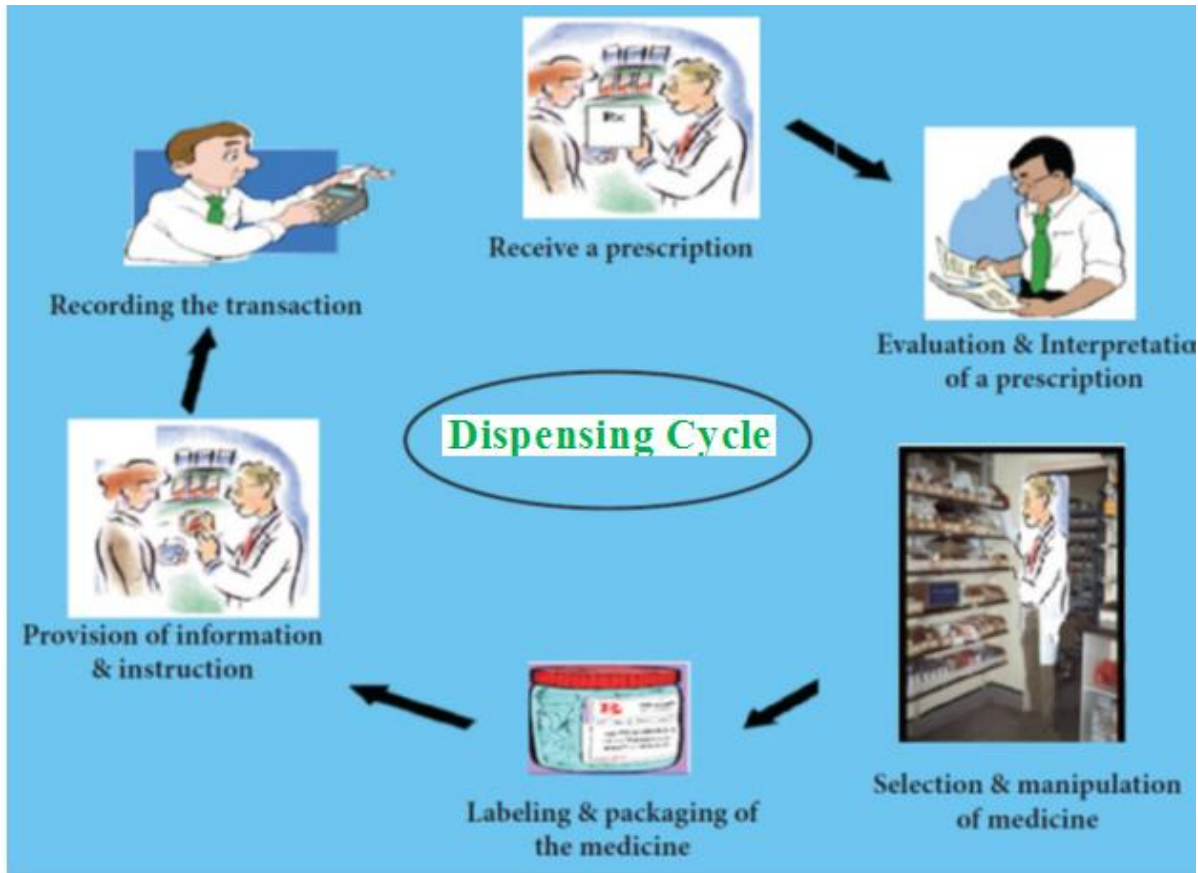


Figure 1-2 Dispensing cycle (Prescription Process)

Step 1: Receive, Interpret and Evaluate the Prescription

- Upon receiving a prescription confirm patient name to prevent mix up of prescriptions.
- Cross-checking name and identity of the patient when issuing the medicines.

A. Evaluation for legality

- A prescription is **legal** when:
 - written (can also be typed) and signed by authorized prescriber
 - medicines are written on the right prescription such as NPS prescription used (narcotic and psychotropic prescription) for controlled drugs
 - date of issue not exceeding 15 days for narcotic & psychotropic substances and 30 days for other medicines
 - has all information required to be contained with respect to parts of prescription.

B. Evaluation for Legibility

A brief examination of each prescription should be made immediately upon receiving it from the patient to ascertain the legibility of various parts of the prescription. Any doubt regarding the reading of the prescription (i.e. name of medicines or directions), should be examined closely and, if necessary discussed/consulted with other pharmacists or the prescriber without arousing doubts or fears in the patient.

Handwritten names of patients and medicines are often difficult to read. In case of illegibility of name, age, etc., ask the patient for the correct spelling tactfully. For example the pharmacy professional may ask “Excuse me, is the first name Meseret or Mahelet?”

Always use ‘please’, ‘excuse me’ etc. and be polite

Every prescription should be read and understood thoroughly before attempting to dispense it. Every word, abbreviation, has a meaning. To assume that an illegible or confusing word is unimportant inviting a costly mistake. In case of doubt, consult another pharmacy professional or the prescriber.

‘Never dispense guess work’

Legibility is a problem requiring alertness and critical judgment on the part of the pharmacy professional. Careless **handwriting** and **similarity** in spelling names of different medicines add to the difficulty.

Example of a Reading error:

Medoprazole and mebendazole - due to illegible handwriting of prescribers, Medoprazole could be read as mebendazole. Medoprazole is a brand containing omeprazole where as mebendazole is an antihelmentic two different medicines used for two different conditions. When handwriting is illegible, the best thing to do is to contact the prescriber over the phone and confirm.

Remember, you are dealing with medicines thus & lives of patients. So be sure of what you are dispensing. Imagine the disastrous consequences of dispensing the wrong medicine.

The dosage form, the dosage and the quantity to be dispensed have to be legible so that dispensing becomes easier for the pharmacy professional. The instructions written for administration should state clearly what the prescriber expects from the patient so that the pharmacy professionals can

counsel the patients efficiently. All terminology, including units of measures and Latin abbreviations should be properly interpreted and checked.

C. Identifying the patient's condition

D. Completeness of the prescription

- The prescription serves as a vehicle for communication from the licensed medical practitioner to the pharmacy professionals about the pharmaceutical care of the patient.
- **Details to be checked for completeness of the prescription**
 - ✓ Seal of the health institution or header
 - ✓ Prescriber's details (name of prescriber's, qualification, signature and date)
 - ✓ Patient's details (name of patient, address, sex, age, weight and diagnosis)
 - ✓ Medicine details
- Checking the medicine details will include checking:
 - Name of the medicine and Dosage form
 - Strength/ potency of the medicine
 - Total amount to be dispensed and availability
 - Dosage and directions for use
 - Frequency of administration and duration of the treatment

1. Name of the medicine

The name of medicine must be legible and correct without a doubt. Since many brands sound alike, brand confusion is quite common especially if the handwriting is illegible and the pharmacy professionals proceeds on the basis of guesswork. The prescriber should ideally write the generic name in parentheses against the brand name or write the generic name alone. This makes it easier if the pharmacy professional is not familiar with the brand prescribed. It would also aid in avoiding brand confusion.

If the prescriber writes the generic name alone, the pharmacy professional can give a brand of his choice. However, pharmacy professional's responsibility is to ensure the brand is of a standard company and registered by FMHACA, and is cost effective at the same time. The pharmacy professional has to proceed ethically and morally, and in the best interest of the patient.

2. Dosage Form

Some medicines are available in many different formulations. It is essential to check that the product on the prescription is available in the correct formulation, and to correctly choose the

formulation. Confusion and mistakes can be made if the name of the formulation is similar to another formulation. For example, tablet formulations of a medicine are available as tablets of 25 mg and 50 mg, dispersible/effervescent tablets, and 100mg sustained release tablets.

The same medicine could be available as tablets, capsules, and even injections. It is important to check the prescriber's prescription for the dosage form. If the dosage form is not specified, advisable to call up prescriber & find out if medicine is available as different formulations, e.g., diclofenac available as 50mg tablet, 100mg suppository & 75m/3ml injection

Dermatological preparations such as creams, ointments, gels and lotions are not necessarily interchangeable; in fact wrong use can cause problems. The same medicine could be available as cream, gel, lotion and ointment and the prescriber may decide the exact dosage form to be dispensed to a particular condition. But, prescribers may write without specifying the dosage form. Example – dermivate 25 gram # one tube, apply nocte; retinoic acid 0.5% # one tube; apply once a day, it may be available as gel and lotion; fucidic acid # one tube; apply bid, it may be available as cream and ointment forms.

- In such cases, the pharmacy professional has to choose the dosage form: the decision to use an ointment, paste, cream, or lotion depends on
 - ✓ degree of skin penetration of the medication
 - ✓ characteristics of the skin to which the product is being applied.
- For ointments (oleaginous bases) are generally used on dry scaly lesions as their emollient properties will aid in re-hydrating the skin and they stay on longer.
- Pastes are generally applied to an area that is intended to be protected

3. Strength/potency of the Medicine

The pharmacy professionals should check that the strength is mentioned. There may be cases for prescribers to prescribe medicine without the strength. If no strength is mentioned, it cannot be assumed that the lowest or highest strength has to be dispensed. This is because many times the lower strength may not be sufficient to treat the condition or higher strength may lead to toxicity.

Example, combination of amoxycillin and clavulanate (Augmentin) is available as 1gm, 625mg, 412mg, 375mg, and so on. If a lower dose is given for an adult it may not be sufficient to kill the microbial load and cure the infection. If the strength is not stated on the prescription, mostly it may be necessary to contact the prescriber for confirmation of the appropriate strength.

Activity

The prescriber prescribes a combination of amoxicillin and clavulanate and mentions the dose as take 5ml twice a day. It is available as amoxicillin 125mg + clavulanic acid 31.25mg and amoxicillin 200mg + clavulanic acid 28.5mg. **What you are going to do?**

4. Quantity to be Dispensed

The prescription should lead to arrive at the exact number of the total quantity to be supplied to the patient. Pharmacy professional should check this quantity to confirm that it is appropriate for the patient, and that the product can be supplied in such quantity. For any product with a short expiry period, ensure that the quantity dispensed will not last longer than the expiry date. In case the duration of therapy or total quantity to be dispensed is not mentioned, it will be necessary to contact the prescriber.

Activity: On December 7, 2017, the patient brought the prescription which read as follow; ‘metformin 500 mg tablets p.o 1 tablet twice daily for 3 months’ for a chronic patient who has been taking the medicine since 3 years ago. The stock available of metformin 500 mg tablet in the pharmacy has an expiry date of January 31st 2018 and no fresh stock is available. What to do? Is there a way to dispense for him all stocks?

Remember if the expiry date of a product is labeled as January 2018, then the product can be used until the end of January 31st 2018.

5. Dosage and Directions for use

A knowledgeable and an alert pharmacy professional can be a great asset and a lifesaver especially if the prescriber makes mistakes (at times major ones) while prescribing.

6. Contraindications

The age, sex, disease(s) conditions, or other characteristics of a patient may cause certain prescribed medicines to be contraindicated. The pharmacy professional should look out for such contraindications. The dose should always be checked taking into account the patient's age, and weight (especially for a child or for the elderly and pregnant woman).

The dose should be carefully checked in case of children, and for all categories of potent medicines. Confirm the units written on the prescription, i.e. milligrams, micrograms, decimal points, etc. for medicines like digoxin.

Example; you need to check carefully whether the prescription states: 0.25 mg or 0.025 mg, 0.5mg or 50mg, 0.125mg or 125mcg (microgram). Pharmacy professional should verify, whether the dosage prescribed is within standard minimum and maximum dose range. Use standard textbooks or reference books for the standard dose.

Medicines that have a very **wide dose range** can be a little tricky. It may be difficult for pharmacy professionals to detect inappropriate doses, and extra vigilance is needed. Example for amoxicillin, the recommended dose is 20-50 mg per kg body weight per day. Thus making it difficult for the pharmacy professionals to gauge whether the prescribed dose is correct or not.

Develop a professional and good relationship with prescribers in the vicinity of the pharmacy or with those whose prescriptions come to you, so that you feel confident and not afraid to talk/discuss with the prescriber about a possible prescribing error.

7. Frequency of Administration

Check if the frequency recommended by the prescriber is as per the standard dosing patterns. Doses more frequent than standard, proven doses may cause toxic manifestations. At the same time, doses lesser than standard, required doses may result in failure to treat the condition properly. In addition to frequency of administration, adherence to the time schedule is also important. For instance, patients taking medicines for hypertension have to take the medicine at the same time to maintain blood levels of the medicine.

E. Correctness of the Prescription

- **Double medication:** (same medicine or different medicine with same pharmaco-therapeutic effect) concurrently prescribed by the same or different prescribers to the same patient.
 - ✓ Example; if a patient has been prescribed diclofenac for fever, and if the dentist has prescribed ibuprofen for the same patient, it could lead to overdosing of anti-pain drugs, and result in the risk of gastrointestinal bleeding and may aggravate hypertension.
- **Interactions:** many medicines are known to interact with other prescribed or OTC medicines, food, diseases, herbal medicines, and laboratory results.
 - Ideally, all multiple item prescriptions should be checked for medicine interactions.
 - If a prescribed item is known to interact with many medicines or to interact with OTC medicines then it is imperative that the pharmacy professionals check with the patient which other medicines or traditional/complementary medicines the patient is taking, in order to eliminate possible medicines interactions.

- Any medicine interactions likely to render the therapy ineffective or cause undesirable effects to the patient, or affect the treatment in any way, should be brought to the notice of the prescribing prescriber (without unduly alarming the patient).

Example –

- Acetylsalicylic acid taken can increase the effect of an anticoagulant (warfarin) that a patient is taking, and may thus lead to bleeding.
- Patients taking ciprofloxacin should avoid taking antacid within 2-3 hours because the antacid can drastically reduce the absorption of ciprofloxacin
- While interactions should be considered when dispensing all prescriptions, some groups of patients are particularly vulnerable, and extra vigilance is required. (Pregnant women, children, elderly, and those with kidney or liver malfunction)
- Known allergies should be checked, particularly for antibiotic prescription, where prescribers fail to consider cross sensitivities within groups of medicines e.g. penicillin.
- Also check if there is any therapeutic or other type of incompatibility.
 - ✓ e.g., a pharmacy professionals may know that the client regularly takes oral contraceptives, but the prescriber may not have asked or not known about it.
- At times, a prescriber may have prescribed a medicine without considering certain aspects, e.g., a prescriber may prescribe a medicine without confirming with a woman whether she is pregnant or not.
- A pharmacy professional can question the patient politely about, whether she is pregnant, or the patient/client may pose the question herself while the prescription is being filled.
- **History of overuse**, under use or misuse of medicines by the patient.
- **Check for overwriting**: Overwriting can be done by the patient, to buy extra medicines (especially habit forming medicines or medicines of abuse).
- **Fake/false prescription**: pharmacy professionals should be alert to detect misuse of prescription blanks by clients (obtained by stealing from private practitioners or from Government hospital outpatient departments, where blanks are often left lying around).
 - ✓ Pharmacy professionals should also be alert to fake prescriptions written/ printed by the patient or client coming to the pharmacy.
 - ✓ If the handwriting is not the usual handwriting of the prescriber or you notice it to be unusual otherwise, confirm with a senior colleague or call the prescriber to confirm.

✓ Do not dispense such prescriptions, and be sure to alert the prescriber about misuse.

➤ **For potent medicines, and medicines with a narrow therapeutic index:**

- Special care has to be taken with such medicines, as slight changes in systemic concentration lead to marked changes in pharmacodynamics responses.
- Examples of narrow therapeutic index medicines: digoxin, lithium, phenytoin, warfarin

➤ **Special care has to be taken in case of:**

a) Medicines with similar names:

- Certain medicines have names that appear similar when carelessly written or when not read carefully, particularly likely if strengths & doses of the two preparations are similar.
- Doubts should always be resolved by checking with the prescriber.
- Example of similar names that illustrate the pit falls are: folic acid versus folinic acid.

b) Abbreviations

Although widely used in prescription writing, abbreviations can kill. This is because in health care there are no recognized standards for abbreviations, and most of the time, prescribers invent their own. Secondly, different individuals/pharmacy professionals may assume or interpret abbreviations differently.

Examples: 'HCT' 25mg was intended to mean hydrocortisone 25mg, but hydrochlorothiazide was dispensed. 'CPZ' may refer to chlorpromazine, an antipsychotic or to carbamazepine, which is an anticonvulsant. 'CPM' can mean chlorpromazine or chlorpheniramine

Never hint on abbreviations, be sure to confirm with the prescriber.

➤ **Changes to the prescription**

Before a pharmacy professional attempts to dispense a prescription, he/she must read and understand it thoroughly. If any portion of the prescription is not understood, or if he/she has detected an incompatibility, he/she should consult the prescriber who wrote the prescription.

Any changes made to the prescription over the telephone by the prescriber, should be recorded on the prescription, with the words "changes made over the telephone, in consultation with the prescriber at (time) on (date)" and should be signed and stamped by the pharmacy professional. This exercise facilitates a trust based professional relationship with the prescriber, besides documenting the changes made to the legal document - the prescription, by the pharmacy professional. Many pharmacy professionals hesitate to call the prescriber about these matters, but,

if the calls are executed tactfully, there is no reason why they should not create a better understanding between the persons of both professions.

F. Therapeutic aspects

- the safety of the medicine,
- possible contra-indications,
- drug/drug interactions,
- drug/food interaction,
- drug/disease interactions, and
- treatment duplications.

G. Appropriateness of the individual

- Confirm that the dose and duration of prescribed medicine are in the normal range for the patient (noting sex and age or weight)
- Under no circumstances should an untrained person attempt to read or discuss the prescription with the client.

Step 2: Selection and manipulation of the medicine

- Select stock container of pre-pack reading the label and cross matching the medicine name and strength against the prescription.
- Read the container label at least twice during the dispensing process.
- Do not select the prescribed medicine according to the color or location of container.
- Do not open many stock containers at the same time. This trend will lead to errors and/or expose the medicines to air and eventually leads to deterioration in quality.
- Open and close containers once at a time.
- While counting, pouring or measuring, the following points should be noted:
 - short and/or over counting should be avoided
 - Clean counting tray and/or spoon used
 - Graduated measuring cylinder and/or flask must be used for measuring liquid.
 - If small volume is to be measured, small measuring cylinder/flask has to be used (if compounding is performed in the pharmacy).
- Appropriate balance should be used (if compounding is performed in the pharmacy)
- In dispensing liquids (if compounding is performed in the pharmacy):

- ★ Must be measured in a clean vessel and should be poured from the stock bottle with the label kept up ward to avoid damage to the label by any spilled or dripping liquid.
- ★ Pour the measured liquid preparation into the container/bottle and label it.
- ★ Provide appropriate bottles with caps for repackaging liquid preparations
- ★ Dispense liquid preparations in suitable containers
- ★ Do not use patient's own bottle
- ★ Dispense each medicine in a different bottle
- In dispensing tablets and capsules:
 - Do not use fingers to count tablets as this can lead to contamination of medicines
 - Use a spoon to put tablets and capsules onto a counting tray
 - Count and put them in a labeled medicine container or pack
 - Close stock containers tightly after dispensing
 - Keep the spoon clean at all times
 - Do not keep the spoon inside the container
- Labeling of dispensed medicines should be clear and legible.
 - ✓ Use separate plastic boxes for different patient's requirements of medicines.
 - ✓ To avoid mix-ups of medicines of different patients, assemble in separate/different boxes, till they are billed and packed.

Skill Practice Session 12: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines.

- 1 Ciprofloxacin 500mg tablet= 0.85 cents
- 1 Paracetamol 500mg tablet= 0.15 cents
- 1 Antacid Suspension bottle= 18.55 birr

BAKO HEALTH CENTER**PRESCRIPTION PAPER****Tel: +251xxxxxxx****P.O.Box: xyz**Patient's Full Name: GGAge: 28 Sex: M Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: West Shewa Woreda/Town: Bako Kebele: 01House No. New Tel. No: 09xxxxxxx Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD:** Typhoid Fever

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Ciprofloxacin 500mg tab po BID for 7days	
- Paracetamol 500mg tab po PRN=10 Tab	
- Antacid Suspension 2tsp pot id for 7 days	
Total Price	

Prescriber's**Dispenser's**

Full Name: _____

Qualification: _____

Registration No: _____

Signature: _____

Date: _____

Skill Practice Session 13: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines.

- One Ciprofloxacin 500mg tablet= 0.85 cents
- One Paracetamol 500mg tablet= 0.15 cents
- One Doxycycline 100mg tablet = 0.65 cents

Nekemte Health Center
PRESCRIPTION PAPER

Tel. No: + 251xxxxxx B.Pox: xxx

Patient's Full Name: G T

Sex: F Age: 25 Weight: 50kg Card No. 002511

Region: 04 Town: Nekemte Kebele: 03

House No. New Tel. No: xxxxx xxx ☐ Inpatient ☐ Outpatient

Diagnosis, if not ICD: Typhoid + Typhus

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx Ciprofloxacin 500mg tablet po/day for 7 days	
Paracetamol 500mg tablet po PRN	
Doxycycline 100mg BID for 7 days	
Total Price	

Prescriber's

Full name: TT

Qualification: HO

Registration # HO/1999/08

Signature: Signed

Date: 22/7/2016 22/7/2016

Dispenser's

Step 3: Labeling and packaging of the medicine in an appropriate container

The containers used for dispensing must be appropriate for the product dispensed. All containers intended for medicinal products must be protected and kept free from contamination.

A. Packaging of medicines

Medicines must be suitably contained, protected and labeled from the time of manufacture until they are used by the patient. The container must maintain the quality, safety and stability of the medicine throughout this period.

➤ The selection of packaging for medicines depends on:

- Nature of the medicine and dosage form
- Type of patient
- Method of administering the medicine
- Required shelf-life
- Use, such as for dispensing.

Original containers used by manufacturers are expected to protect medicines for their specified shelf-life. Because original containers may contain large amount of medicines, repackaging of medicines into another container may be necessary in order to dispense medicines for patients. Such repackaging procedure can be done at-the –spot or in advance.

Prepackaging is the process by which the pharmacy professional transfers a medication manually from a manufacturer's original commercial container to another type of container in advance (before clients come to medicine retail outlets).

The following guidelines are recommended in prepackaging of medicines:

- Prepackaging procedures must comply with laws and regulations.
- Prepackaging operation area must be clean and separate from other pharmacy activities.
- Only one medicine product at a time should be prepackaged in a specific work area.
- Before beginning a prepackaging run, a physical evaluation (color, odor, appearance, and markings) of medicine being prepackaged should be made to assure product integrity.
- Bulk container should also be examined for evidence of damage and contamination.
- Prepackaging equipment operated in accordance with established instructions.
- There should be valid justification and authorization by the supervisor for any deviation from those instructions on the part of the operator.
- The pharmacy professional must use available data on the characteristics of all packaging material used to protect the integrity of the medicine product: data on the chemical

composition, light transmission, moisture permeability, size, thickness (alone or in laminate), recommended sealing temperature, and storage requirements.

Upon completion of prepackaging, all unused medicine stock, unused labels and finished packages should be removed from the prepackaging area. The packaging equipment should then be completely emptied, cleaned, and inspected before commencing the next prepackaging operation. All prepackaged medicines stored in a temperature and humidity controlled environment accordance with the manufacturer's instructions.

The main advantages of prepackaging medicines

- allows enough time for patient counseling
- minimizes dispensing errors from confused operation due to heavy patient load.

B. Packaging aids and Materials

- Re-packing materials: bottles (plastic, glass), collapsible tubes, envelops (plastic, paper) etc.

C. Labeling of medicines

- Functions of a label on a dispensed medicine
 - uniquely identify the contents of the container
 - ensure patients have clear and concise information about medicines.
- Each dispensed medicine must be
 - ✚ appropriately labeled to comply with legal and professional requirements.
 - ✚ labeled and the labels should be unambiguous, clear, legible and fixed.
 - ✚ If possible lettering should be printed.
- The following information should be indicated on the label of dispensed medicines.
 - Patient name, Generic name, strength and dosage form
 - Dose, frequency and duration of use
 - Quantity of the medicine dispensed
 - How to take or administer the medicine?
 - Storage condition
- For extemporaneous or prepackaged medicines there should be a batch number, expiry date or beyond-use date

Table: Medicine Label information

○ Name of Health Institution _____	○ Date _____
○ Name of Patient _____	
○ Generic name, strength and dosage form of medicine _____	
○ Frequency and duration of medicine administration _____	
○ Quantity of the medicine dispensed _____	
○ How to take the medicine _____	
○ Expiry date _____	
○ Storage condition _____	

Labeling problem of drug retail outlets of Ethiopia

- ✓ dispensed medicines without a label
- ✓ incomplete label, or illegible label.
- ✓ used paper envelopes size may not allow to write required information.

Case study

Ato Kebede went to a pharmacy with a prescription for nitroglycerin sublingual tablets. The pharmacy worker repackaged the prescribed number of tablets in paper envelopes and dispensed with appropriate instructions for use. Some other day, Ato Kebede consulted the pharmacy professional about decreasing efficacy of the medicine dispensed.

Comment on the cause of decreasing effectiveness of the dispensed medicine.

Discussion: Nitroglycerin is volatile medicine. It should be repackaged in tightly closed containers (bottles). The use of paper envelopes for repackaging leads to a reduced efficacy of nitroglycerin, a possible reason for the complaint of Ato Kebede.

Case study

The pharmacy professional received a prescription with the following information:

Ibuprofen 400mg tablet

Mitte 60

One t.i.d.

The pharmacy professional dispensed 60 tablets of ibuprofen 400mg and wrote a label that the patient should take three tablets daily with or after food.

Comment on dosage.

Discussion: The prescription was to take one tablet three times a day. The information on the label is not clear. Accordingly, the patient may take three tablets at a time, which may lead to an occurrence of adverse effects or loss of efficacy. Understanding the meaning of Latin abbreviations that may appear on the prescription papers is important.

Skill Practice Session 14: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines.

BAKO HEALTH CENTER**PRESCRIPTION PAPER****Tel: +251xxxxxxx****P.O.Box: xyz**Patient's Full Name: GGAge: 28 Sex: M Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: West Shewa Woreda/Town: Bako Kebele: 01House No. New Tel. No: 09xxxxxxx Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD:** Typhoid Fever, Cough

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Ampicillin 500 mg cap po BID for 7 days # 33	
- Diclofenac 500 mg tab po PRN=10 Tab # 100	
- Diphenhydramine syrup 6 tsp po t id for 7 days # 1/2 bottle	
Total Price	

Prescriber's**Dispenser's**

Full Name: _____

Qualification: _____

Registration No: _____

Signature: _____

Date: _____

Skill Practice Session 15: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines, and use appropriate packaging material.

- One Ciprofloxacin 500 mg capsule= 0.75 cents
- One Diclofenac 50 mg tablet= 0.35 cents
- One Diphenhydramine syrup bottle= 13.25 birr

BAKO HEALTH CENTER**PRESCRIPTION PAPER****Tel: +251xxxxxxx****P.O.Box: xyz**Patient's Full Name: GGAge: 28 Sex: M Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: West Shewa Woreda/Town: Bako Kebele: 01House No. New Tel. No: 09xxxxxxx Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD:** Typhoid Fever, Cough

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Ciprofloxacin 500 mg cap po QID for 7days	
- Diclofenac 50 mg tab po PRN=10 Tab	
- Diphenhydramine syrup 2 tsp po tid for 5 days	
Total Price	

Prescriber's**Dispenser's**

Full Name: _____

Qualification: _____

Registration No: _____

Signature: _____

Date: _____

Step 4: The provision of information and instruction to client**General Steps of Counseling**

All medicines should be dispensed with adequate and appropriate information and counseling. Information must be structured to meet the needs of individual patients and questions and answers should be used to check the patient understands. Written information should be provided to supplement verbal communication as appropriate. Counseling should ensure that the patient has an unequivocal understanding of the instructions for use, and any distinct characteristics or requirements of the medicine. Counseling should cover matters that will enhance or optimize medicine therapy. The prepared, packaged and labeled medicine is handed over to the right patient or care provider with appropriate medicine information. The information in the form of verbal and/or written instructions should include the following:

- How much and how often to take the medicine
- When to take the medicine (e.g., before or after meals)
- How long the treatment is to last (e.g., why the entire course of an antibiotic treatment must be taken)
- How to take the medicine (e.g., with water, chewing or swallowing)
- How to store the medicine (e.g., avoid heat, light and dampness)
- Not to share medicines with other persons
- Which types of foods and beverages should avoid while taking the medicine
- To keep medicines out of reach of children
- One has to demonstrate to the patient on how to administer the dispensed medications in case of inhaled administration and suppository application
- Patients should also be informed not to stop treatment when side effects occur or in the absence of response without consulting the prescriber or dispenser.
- Finally, check whether patients have understood the information provided (see figure 8-4)



Figure 8-4: Communicating with a patient at the dispensary

Step 5: Recording the transaction

Prescriptions should be recorded and documented as proof of transaction between the patient and the dispenser. Prescriptions can therefore be traced back if any need arises. All dispensing units should have a standardized Prescription Registration Book (PRB) for recording every pharmaceutical issued to a patient. A computerized dispensing and registration system may also be used, but should always be supported by paper back up. The PRB should be completed at the time of dispensing or at the close of the working day.

For a prescription which is returned to a patient because all the items in the original prescription could not be filled, the medicines that have been dispensed from the pharmacy should be copied on a blank prescription and the prescription should be filed appropriately. On the original prescription, which is retained by the patient, the word “dispensed” should be stamped adjacent to those items which have been dispensed. For prescriptions which are to be refilled on a later date, the dispensing information should be entered into the registration book before returning the prescription to the patient. The official seal of the pharmacy/Health institution, name and signature of the dispenser, the date of dispensing and the next refill date should be written on the prescription.

Documentation and report

- Receipts for requisition, receiving & prescription registration book should kept properly.
- Blank prescription should be kept carefully, only prescribers have access to them.
- Filled prescription should be kept as a receipt. Prescriptions for narcotic and psychotropic Substances should be kept for 5 years and other prescriptions for 2 years. Thereafter, they should be disposed carefully in the presence of appropriate body.
- Regular reports on medicine consumption & prescribing pattern from patient prescription registration book should be prepared and report to the appropriate body timely.
- Information obtained from prescription registration book could be used for further planning and efficient utilization of resource.
- The report on physical inventory shall be documented

Tables for PRB

Step 6: Prescription filing

Each prescription should be signed and accountability accepted by the dispenser or other authorized person for the correctness of the dispensing of the medicine and confirming that the medicine was supplied.

- At the close of each day all dispensed prescriptions should be organized
- Prescriptions should be filed sequentially by day in a single container/carton for each month. The container should be labeled with the month and year.
- Containers should be arranged on a monthly basis.
- Normal prescriptions filed securely for two years and special prescriptions for 5 years.
- Prescriptions, patient & medication related records & information should be documented & kept in a secure place that is easily accessible only to the authorized personnel.

Skill Practice Session 16: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines,

**BAKO HEALTH CENTER
PRESCRIPTION PAPER**

Tel: +251xxxxxxx**P.O.Box: xyz**Patient's Full Name: GGAge: 28 Sex: M Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: West Shewa Woreda/Town: Bako Kebele: 01House No. New Tel. No: 09xxxxxxx Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD:** Typhoid Fever, Cough, bacillary dysentery, PUD

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Amoxicillin 500 mg cap po BID for 7days	
- Ibuprofen 100 mg tab po PRN=10 Tab	
- Cotrimoxazole 480 Po BID for 10 days	
- Cimetidine 600 m QID for 10 days	
- Dextrometorpan syrup 2 tsp po QID for 5 days	
Total Price	

Prescriber's**Dispenser's**

Full Name: _____

Qualification: _____

Registration No: _____

Signature: _____

Date: _____

Skill Practice Session 17: Evaluation of prescription

Instructions: Evaluate the prescription, interpret the abbreviations, and calculate the total quantity to be dispensed, price of each medicine and identify the groups/family of the prescribed medicines, use appropriate packaging material, write label in the client's local language and provide patient counseling.

- One Amoxicillin 500 mg capsule= 0.75 cents
- One Ibuprofen 400 mg tablet= 0.65 cents
- One Cotrimoxazole 480 mg tablet= 0.90 cents
- One Diclofenac 50 mg tablet= 0.35 cents
- One Cimetidine 400 mg= 1.15 birr
- One Diphenhydramine syrup bottle= 13.25 birr

ADAMA HEALTH CENTER**PRESCRIPTION PAPER****Tel: +251xxxxxxx****P.O.Box: xyz**Patient's Full Name: GGAge: 28 Sex: M Weight: 55 kg MRN: 0000xxxxRegion: Oromia Zone: West Shewa Woreda/Town: Bako Kebele: 01House No. New Tel. No: 09xxxxxxx Outpatient: ☐ Inpatient: ☐**Specific diagnosis, if not ICD:** Bronchitis, bacillary dysentery, PUD

Drug Name, Strength, Dosage Form, Frequency, Duration, Quantity, Route of Administration and Other Information.	Price (dispensers use only)
Rx - Amoxicillin 500 mg cap po TID for 7days	
- Ibuprofen 400 mg tab po PRN=10 Tab	
- Cotrimoxazole 960 Po BID for 10 days	
- Cimetidine 400 m BID for 10 days	
- Diphenhydramine syrup 2 tsp po TID for 5 days	
Total Price	

Prescriber's**Dispenser's**

Full Name: _____

Qualification: _____

Registration No: _____

Signature: _____

Date: _____

Case Scenario

Read the following case scenario to understand the six steps of good dispensing:

Institution Name: Halila Health Center Tel No: 022331....

Patient's full Name: TH

Sex: F Age: 26 Weight: 68 Card No.: 024456/10

Region: Oromia Town: Asella, Woreda: Tiyo, Kebele: 07

House No. XYX65 Tel. No: 09123.... ☐ Inpatient ☐ Outpatient

Diagnosis, if not ICD: Osteomyelitis, Vaginal Candidiasis, Minor Skin abrasion

Medicine Name, Strength, Dosage Form, Dose, Frequency, Duration, Quantity, How to use & other information	Price (dispensers use only)
Rx	
1. Ampicillin capsule, 1 qid # 28	
2. Gentian violet solution # 1 bottle	
3. Diclofenac e/c 50 mg # 10 tablets	
4. Clotrimazole 500mg vaginal tablet, once a day for seven consecutive days	

Prescriber's

Dispenser's

Full name: Fita Gonfa

Bontu Tola

Qualification: Health Officer

Pharmacy Technician

Registration No: 4556/2008

663/2008

Signature Signed

Signed

Date: 28/03/2010

28/03/2010

See over leaf

Step 1: Evaluation and interpretation of a prescription

1. Interpreting the type of treatment

Bontu understands the patient's conditions from prescription i.e. osteomyelitis, vaginal candidiasis and minor skin abrasion. Based on Standard Treatment Guideline for Health center 2010, she correlates TH's condition with prescribed medicines.

Then, she decides for

- ✓ Osteomyelitis- cloxacillin 500 mg P.O every six hours for 3-6 weeks
- ✓ Vaginal candidiasis- clotrimazole 100 mg vaginal tablet once a day, at bedtime, for seven consecutive days and
- ✓ Minor skin abrasion genital violate.

Therefore, Bontu politely advises Mr. Fita to change ampicillin with cloxacillin and she excused TH for delay and called to Mr. Fita. After soft greeting with Fita, she explained him about TH's medicines based on formulary and STG for health center. Mr. Fita thanked and asked Bontu to send TH back. TH got the following corrected prescription and brought to Bontu.

Corrected Prescription Paper**PRESCRIPTION PAPER**Institution Name: Halila Health Center Tel No: 022331....Patient's full Name: THSex: F Age: 26 Weight: 68 Card No.: 024456/10Region: Oromia Town: Asella, Woreda: Tiyo, Kebele: 07House No. XYX65 Tel. No: 09123.... ☐ Inpatient ☐ OutpatientDiagnosis, if not ICD: Osteomyelitis, Vaginal Candidiasis, Minor Skin abrasion

Medicine Name, Strength, Dosage Form, Dose, Frequency, Duration, Quantity, How to use & other information	Price (dispensers use only)
Rx	
1. Cloxacillin 500 mg capsule, 1 caps P.O QID for 21 days # 84 caps	
2. Gentian violet 1% solution, apply gently on the lesion # 1 bottle	
3. Clotrimazole 500mg vaginal tablet, once a day for seven consecutive days	
4. Diclofenac 50 mg e/c tablet, 1 tab P.O TID # 10 tablets	

Prescriber's

Dispenser's

Full name: Fita GonfaBontu TolaQualification: Health OfficerPharmacy TechnicianRegistration No: 4556/2008663/2008Signature SignedSignedDate: 28/03/201028/03/2010

See over leaf

2. Evaluation of prescription

➤ For legality

Bontu ensured the legality of the prescription by checking the prescriber's information like name (Fita), titer (signature), registration number (4556/2008), qualification (HO) and heading of prescription. She also checked the prescription is authentic.

➤ Evaluation for legibility, completeness and correctness

- ✓ Bontu confirmed legibility, completeness & correctness of the prescription.

➤ Identifying the patient:

- Bontu identified patient name, TH from prescription, a five month pregnant and also she did not encounter any allergy & had no history of ulcerative, renal and hepatic problems.

➤ Identifying the medicine

The prescribed medicines were:

1. Cloxacillin 500 mg capsule,
2. Gentian violet 1% solution
3. Clotrimazole 100 mg vaginal tablet
4. Diclofenac e/c 50 mg tablet

a) Checking the dosage form

- ☉ The four prescribed medicines were prescribed in appropriate dosage form
 - ❖ cloxacillin 500 mg capsule,
 - ❖ gentian violet solution,
 - ❖ clotrimazole vaginal tablet
 - ❖ diclofenac enteric coated (e/c) tablet

b) Strength

- ☉ The four prescribed medicines were prescribed in appropriate strength
 - ❖ cloxacillin 500 mg capsule
 - ❖ gentian violet 1% solution
 - ❖ clotrimazole 100 mg vaginal tablet
 - ❖ diclofenac 50 mg enteric coated (e/c) tablet.

c) Appropriateness of dosage

- ❖ TH is 29 years old and she did not have renal and hepatic problems. So according to Health center Formulary were appropriate

- cloxacillin 500 mg capsule every 6 hour
- clotrimazole vaginal tablet (100mg once a day)
- diclofenac 50 mg e/c tablet every 8 hour

d) Method of administration

- Cloxacillin 500 mg capsule and diclofenac 50 mg e/c tablet are administered orally
- Gentian violet 1% solution is applied topically
- Clotrimazole 100 mg vaginal tablet is administered vaginally

e) Duration of treatment

- Cloxacillin for Osteomyelitis for 3-6 weeks
- Clotrimazole vaginal tablets (100mg once a day), at bed time, for 7 consecutive days.

Bontu confirms the appropriateness of all prescribed medicine for TH based on STG for Health center (2010) and Health center Formulary and also discussed with senior pharmacist who works in this health center.

➤ **Therapeutic aspects**

a) Safety of the medicine

- ✓ TH told Bontu she is not allergic to any medicines she used to take before and she also added she has no any ulcerative, renal as well as hepatic problems and she was not alcohol addict.
- ✓ Even though TH never encountered any allergic conditions before, it is advisable to tell the possible allergy due to cloxacillin

b) Possible contra-indications

- Based on the health center's formulary four of the indicated medications do not contraindicate with second trimester pregnancy

c) Drug-drug interactions,

- There is no known interaction among the four medicines
- **TH** told that she is not taking other medications
- Since TH is pregnant Bontu advised not to use any medications during pregnancy without consulting health professionals
- Bontu advised not to take any alcohol

d) Drug/food interaction,

- Food affects the bioavailability of cloxacillin when taken with food, so absorption will be lowered and TH may not respond to the therapy, further this may cause cloxacillin resistance.
- Therefore Bontu advised TH to take cloxacillin **1 hour before meals**

e) Drug/disease interactions-no identified drug disease interaction

f) Treatment duplications – since TH told Bontu that she is not taking any medicines, there is no treatment duplication.

➤ **Cost of medicine and availability** of cheaper alternatives identified

- ❖ Any problems with the prescriber and a solution should be worked out in consultation with the prescriber and patient.
- ❖ Before dispensing to TH, Bontu carefully observed step 1(before going to step 2) and she referred formulary and STG for health Center and adjusted accordingly.

Step 2: The selection and manipulation of the medicine

- While counting, using dry and clean spoon count from clean counting tray to pre-pack.

Step 3: The labeling and supply of the medicine in an appropriate container

The dispensing label shall bear at least the following information:

- generic name of the product or each active ingredient, where applicable
- strength, dose, frequency of administration and total quantity
- expiry date and prescriber's name
- name of the person for whom the medicines are dispensed
- directions for use
- name and business address of the dispenser
- date of dispensing, and special precautions as applicable

For example, the label for cloxacillin may be written as following:

Buufata Fayyaa Haliilaa, Lakk. Bilbilaa: 022331....
 Cloxacillin 500 mg capsule, #84 capsules
 Guyyaa hundaa otuu hin nyaatin
 Ganama sa'aatii 1:00tti Ija/habbaa 1 liqimsaa
 Guyyaa sa'aatii 7:00tti Ija/habbaa 1 liqimsaa
 Galgala sa'aatii 1:00tti Ija/habbaa 1 liqimsaa
 Halkan sa'aatii 7:00tti Ija/habbaa 1 liqimsaa
 Otoo addaan hinkutin yeroo isaa eegdanii torban sadihiif fudhattu
 Natti woyyaa'eera jettanii gorsa ogeessa fayyaatiin ala qoricha addaan hinkutina
 Hamma isinii ajajme dabarsitanii ykn xinnessitanii hinfudhatina
 Qoricha nama biroof qoodanii kennuun dhoorkaadha
 Qorich iddoo ifni aduu hingeenye kaa'a
 Ajaja ogeessa fayyaatiin ala qoricha biroo hinfudhatina
 Yoo isin hooqsise ykn wanti addaa isin mudate ogeessa fayyaa mari'achiisa
 Maqaa dhukkubsataa: _____
 Maqaa ogeessa fayyaa; _____
 Guyyaa: _____
 Guyyaa qorich tajaajila kennuu dhaabu: _____
 Qoricha iddoo daa'imman hindhaqqabne kaaya

Step 4: The provision of information and instructions to a client

- ❖ Name and description of the medicine
- ❖ Intended use of the medicine and expected out come
- ❖ Dosage form, dose, route of administration
- ❖ Duration of therapy with emphasis given to completing the entire course for antibiotics
- ❖ Expected time to see a response of the medication and instructions on what to do if the medicine appears not to have the desired effect.
- ❖ The time the medicine taken in relation to other medicines, food, life style interactions
- ❖ Clear instructions on measurement and administration of medicine.

- ✓ If necessary a demonstration such as opening and closing containers or using an aerosol may be necessary.
- ❖ Explanation of harmless effects of the medication such as urine discoloration,
- ❖ Common severe side or adverse effects or interactions and therapeutic interactions that may be encountered, including their avoidance and the action that required if they occur
- ❖ Storage instructions
- ❖ Advice regarding keeping medicines out of reach and sight of children, and clarification on the consequences of sharing medication or keeping extra doses at home
- ❖ Prescription repeats information

Step 6: Prescription filing

- Prescription shall be documented separated by day, month and year dispensed and archive for minimum of two years.

Dispensing for in-patients

➤ There are three basic techniques for hospital medicine distribution to inpatients:

1. Bulk ward stock order system

In a ward stock system, the pharmacy functions as a warehouse and dispense bulk containers on requisition without reviewing individual medicine orders for appropriateness. The main advantage is shorter turnaround time between prescribing and administering the medicine. The use of stock medications should be minimized, although it is appropriate and desirable for certain situations:

- In life threatening emergency situations, medicines should be kept in patient care areas as a time saving measure.
- High volume, low-cost medicines dispensed if there is low risk of medication error.

2. Individual medicine order system

The individual medicine order system closely resembles dispensing to outpatients: a course of therapy is dispensed according to a written prescription for an individual patient. Compared to ward stock distribution the advantages are:

- Pharmacy professional can review the appropriateness of therapy.
- A patient-specific medication profile can be maintained.
- Pharmacy charges to patients are facilitated.
- Closer control of inventory is possible

3. Unit dose system

The preferred system from a patient care perspective is the unit dose system, in which there is the lowest possibility for error. Commonly a twenty-four-hour supply is provided. It minimizes unnecessary expense if treatment is changed. But it requires pharmacy opening for 24 hours.

5.3 Dispensing errors

Dispensing errors are errors that occur during the dispensing process in the pharmacy. They are different from prescribing errors, or errors during consumption of medicine. Some risk is always inherent in pharmacy practice, but if dispensing procedures are systematically laid down, and strictly followed, most dispensing errors can be prevented, or at least minimized.

➤ Various factors can lead to dispensing errors

- Being busier than normal due to less staff or more customers
- Being a new staff member or trainee pharmacy professional

- Interruptions like telephone, doubt/query from staff, etc.
- Atmosphere in the pharmacy and attitude of the pharmacy staff.
- Distractions from different sources
- Mood of the staff, e.g., bad moods.
- Not following the **laid systems** and standard operating procedures (SOPs) in the pharmacy.

Table 5-5 Common pharmaceutical dispensing errors

Common dispensing errors	Possible Causes
Misreading the prescription	Maybe due to a large number of prescriptions, illegible handwriting, careless attitude of dispensing staff, or a bad dispensing environment.
Errors during verbal communication	Due to sound-alike name e.g. metolazone/methazolamide
Picking error - picking the next medicine	Due to similar packing or not being on the shelf attentive or due to some distractions.
Counting error i.e. dispensing the wrong quantity of medicines	Due to interruption during counting or because of work overload/ rush hours
Billing error - entering details on the bill incorrectly. Example, name or strength of the medicine, or entering the patient's name incorrectly.	Due to distraction or inattention while billing, or having bill prepared by a newly appointed staff member who is not well acquainted with the billing system.
Packing error: mix parcels, or putting somebody else's medicine in parcel	Due to similar patient names or same total on the bill, or due to distractions while handing over the parcel.
Expiry error i.e., dispensing expired medicines	Improper attention/careless attitude while dispensing, not checking carefully. The letters or writing on the strip are not easy to read (name of medicine and potency). Strip or cut strip may accidentally be put in a box of a similar looking product.

Example of Picking Errors

You go to pick up metronidazole (manufactured by Cadilla) suspension from the shelf and end up with picking cotrimoxazole suspension because both medicines have similar type of bottle packing material. Now, that is not a justified excuse.

Sometimes manufacturer's packs of different drugs can be of similar design, and may lead to picking errors. Due to similar packing, you could pick the box next to the one you actually intended to pick. That is why you need to be very alert while removing medicines. Check the medicine in details against the prescription before you remove it from the shelf. Even if you are in a hurry, take the time to confirm that you are picking the **RIGHT** medicine from the shelf. Remember that, clients depend on you for the RIGHT medicine, so be **AWARE** of each action at every step while dispensing.

➤ Reasons for picking errors

- Not concentrating on the work/task and thinking/dreaming of something else.
- Distractions due to gossiping, talking with other staff, friends at the counter, or watching TV in the pharmacy.
- Extra workload, doing things at very high speed, or in confusion.
- Assuming that a box picked up is correct, and not verifying it while picking.
- A different medicine placed in the usual place of the required medicine.

It would be unrealistic to state that no error will ever occur in pharmacy. Some error is possible or likely to occur sometime. The aim, however, should be to keep errors down to a minimum.

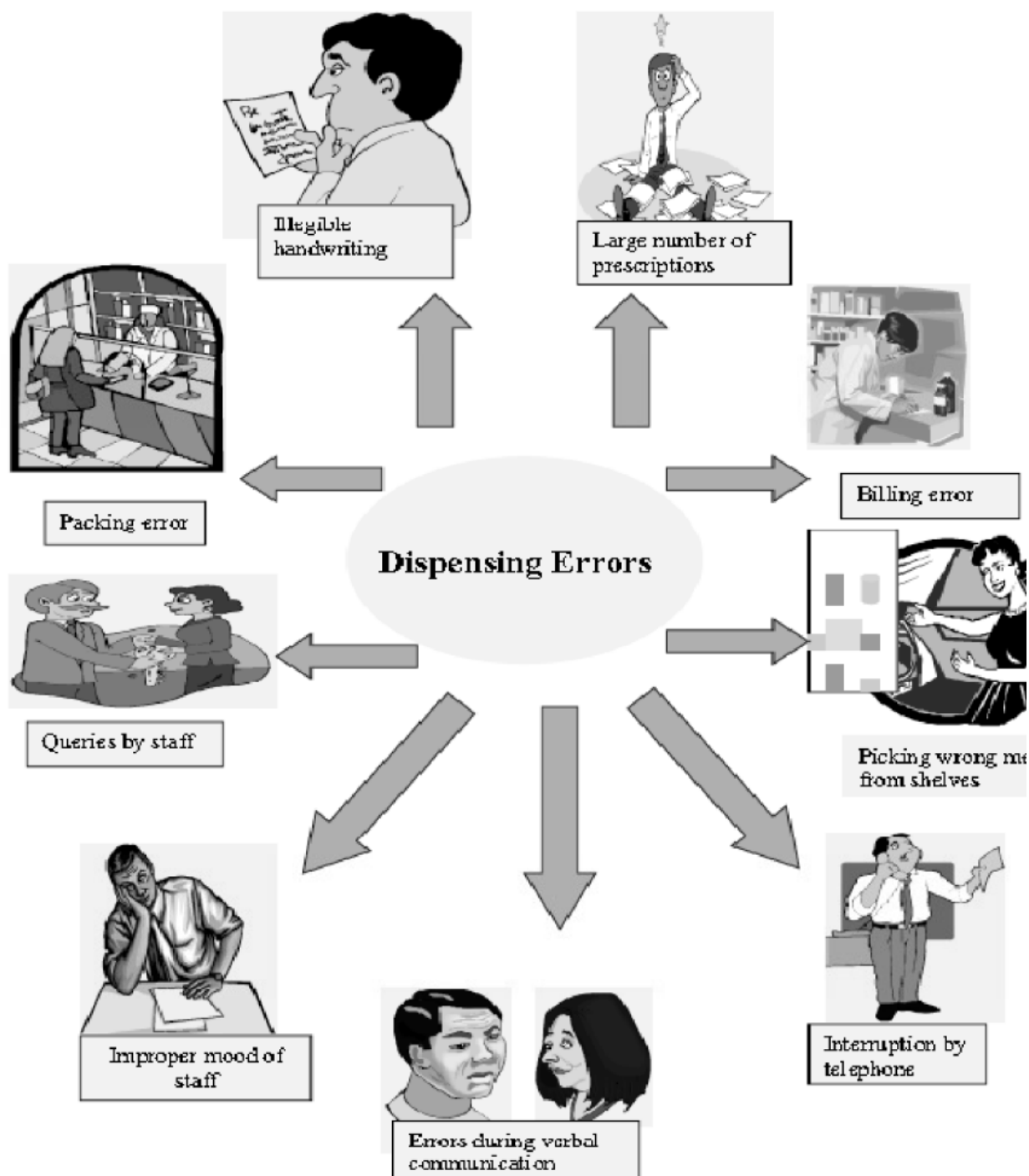


Figure 8-4: Common Dispensing Errors

5.4 Refusal to dispense prescriptions

The pharmacy professionals should politely refuse to dispense a prescription if:

- Essential information is missing or doubtful, and the prescriber cannot be contacted.
- Safety of the medicines is doubtful.
- The prescription does not conform to legal requirements.
- Fake or illegal alteration of the prescription is suspected
 - ❖ prescriptions calling for large quantities of potent medicines
 - ❖ prescriptions written by unfamiliar prescribers for patients unknown to the pharmacy professionals or for any other reason that is apparent, and which prohibits the pharmacy professionals from dispensing the medicines prescribed.

Self-Check

Short answer questions

Elaborate on the prescription dispensing process

Summary

- Good dispensing practice refers to the process of preparing medicines and distributing to users with provision of an appropriate information, counseling and follow up.
- The dispensing process involves the correct interpretation of prescription or oral request, accurate preparation and labeling of medicines with provision of appropriate information.
- Prescription is an order for medicines written by a duly licensed medical practitioner issued to a patient in order to collect medicine from dispensing unit
- Medical and pharmaceutical terms are abbreviated for ease of communication.
- The term dispensing process covers all activities involved, from receiving prescription to issuing prescribed medicine to patient.

Annex-1

Lists of OTC for Ethiopia

Antacids				
Ser. No	Name of Drugs	Strength	Dosage form	MQATD at one time
1.	Aluminum Hydroxide	320 mg/5 mL 360 mg/5mL 500 mg	Mixture/Gel Suspension Tablet (Chewable)	2 bottles 2 bottles 30 tablets
2.	Aluminum Hydroxide + Magnesium Hydroxide [♣]	220 mg + 195 mg/5mL 400 mg + 400 mg	Suspension Tablet (Chewable)	2 bottles 30 tablets
3.	Aluminium Hydroxide+ Magnesium Hydroxide+ Simethicone [♣]	225mg+200mg+25mg/5mL	Suspension	2 bottles
4.	Aluminum Hydroxide + Magnesium Trisilicate [♣]	310 mg + 620 mg/5ml 120 mg + 250 mg ; 250 mg + 500 mg	Suspension Tablet (Chewable)	2 bottles 30 tablets
5.	Magnesium Hydroxide	375 mg/5 ml, 7.75 % 300 mg; 311 mg	Mixture Tablet (Chewable)	2 bottles 30 tablets
6.	Magnesium Trisilicate	500 mg	Tablet (Chewable)	30 tablets
Antispasmodics/Spasmolytic Analgesics				
1.	Hyoscine (Scopolamine) Butylbromide	5mg/5mL 10 mg 7.5 mg, 10mg	Drops Tablet Suppository	1 bottle 10 tablet 10 supp

♣ And any other combination ratio proven to be therapeutically effective can be used

MQATD = Maximum Quantity Allowed to be Dispensed

Antiemetic				
1.	Dimenhydrinate	50mg	Tablet	15 tablets
Cathartics and Laxatives				
1.	Bisacodyl	5mg, 10mg 5mg	Suppository Tablet	10 supp. 10 tablets
2.	Cascara Sagrada	125mg	Tablet	10 tablets
3.	Glycerin	1g, 1.36g, 2g, 2.76g	Suppository	10 supp.
4.	Magnesium Sulphate		Oral powder	1 sachet
5.	Psyllium		Powder	1 bottle
6.	Senna	total sennosides, 7.5mg	Tablet	10 Tablets
Medicines Used for Diarrhea				
1.	Oral Rehydration Salt		Powder	4 sachet
Antiflatulents				
1.	Activated Charcoal	125 mg, 250 mg	Tablet	20 Tablets
2.	Simethicone	60 mg, 80 mg, 95 mg 95 mg, 125 mg	Tablet (chewable) Capsule	20 Tablets 20 Capsules
Antihaemorrhoidal Agents				
	Bismuth Subgallate	2.25% +0.875%+	Ointment	2 tube
	Compound* (Bismuth Subgallate +Bismuth Oxide + Peru Balsam+ Zinc Oxide)	1.875% +10.75% 59mg +24mg +49mg +296mg	Suppository	10 supp.

*And any other antihemorrhoidal preparation proven to be therapeutically effective can be used

Antitussives/Expectorants/Mucolytics				
1.	Bromhexine Hydrochloride	4 m g/5ml	Elixir	1 bottle
2.	Dexchlorpheniramine	2mg/5ml	Syrup	1 bottle
		2mg, 4mg, 6mg	Tablet	10 tablets
3.	Dexchlorpheniramine + Guaifenesin + Pseudoephedrine	2mg +100mg + 20mg/5ml	Syrup	1 bottle
4.	Dextromethorphan Hydrobromide	15mg/ml 5mg, 7.5mg, 15mg/5ml 15mg	Drops Syrup Tablet	1 bottle 1 bottle 10 tablets
5.	Dextromethorphan Hydrobromide + Guaicol Sulphonate	0.3gm+7.6gm/100mL	Syrup	1 bottle
6.	Diphenhydramine+ Sodium Citrate+ Ammonium Chloride	12.5mg +60mg + 130mg/5mL	Syrup	1 bottle
7.	Guaifenesin	100mg, 200mg 200mg 100mg/5mL	Tablet Capsule Syrup	15 tablets 15 Capsules 1 bottle
Antiasthmatics				
1.	Ephedrine + Theophylline	6mg + 30mg/5ml 2.24% + 0.30% 11mg + 120mg	Elixir Syrup Tablet	1 bottle 1 bottle 30 tablets
2.	Salbutamol (Albuterol)	0.1mg/dose 2mg/5ml 2mg, 4mg, 4mg(s/r)	Oral Inhalation (aerosol) Syrup Tablet	1 canister 1 bottle 10 tablets
3.	Theophylline+ Guaifenesin	150mg + 90mg; 300mg + 180mg 150mg + 90mg/15ml 150mg + 90mg	Capsule Elixir Tablet	30 capsules 1 bottle 30 tablets
Antimigraine Headache Medicine				

1.	Acetylsalicylic Acid + Paracetamol+ Caffeine	250mg + 250mg + 65mg	Tablet	20 tablets
Analgesics / Antipyretics				
1.	Acetylsalicylic Acid	75mg, 100mg, (soluble); 300mg, 324mg (microfined 75mg, 81mg, 100mg, 500mg (enteric coated)	Tablet	20 tablets
2.	Diclofenac Sodium	25mg, 50 mg	Tablet	20 tablet
3.	Ibuprofen	300mg 200mg, 400mg (enteric coated, optional) 100mg/5mL	Capsule Tablet Syrup	20 capsules 20 tablets 1 bottle
4.	Paracetamol	100mg/ml 125mg, 250mg 120mg/5ml, 250mg/5ml 100mg, 500mg	Drops Suppository Syrup Tablet	1 bottle 15 supp. 1 bottle 20 tablets
Antirheumatics				
1.	Acetylsalicylic Acid	300mg, 324mg (microfined 500mg (enteric coated)	Tablet	20 tablets
2.	Acetylsalicylic Acid + Paracetamol+ Caffeine	250mg + 250mg + 65mg	Tablet	20 tablets
3.	Ibuprofen	300mg 200mg, 400mg (enteric coated, optional) 100mg/5mL	Capsule Tablet Syrup	20 capsules 20 tablets 1 bottle
Anthelmintics				
1.	Albendazole	100mg/5ml 200mg, 400mg	Oral Suspension Tablet	3 bottles 6 tablets
2.	Levamisole	40mg	Tablet	6 tablets
3.	Mebendazole	100mg/5ml 100 mg, 500 mg	Oral Suspension Tablet	2 bottles 12 tablets
4.	Niclosamide	500mg	Tablet (chewable)	4 tablets
5.	Piperazine 500mg, 622.5mg,	706mg, 750mg, 937.5mg, 1g /5ml (Citrate) 300mg (Adipate)	Elixir	2 bottles
6.	Pyrantel pamoate 250mg	250 mg base/5ml 125mg base	Oral Suspension Tablet	1 bottle 8 tablets
Analgesics / Antipyretics				
1.	Ascorbic Acid (Vitamin C)	200mg/ml	Drops	1 bottle

		100mg, 500mg, 1g	Tablet	30 tablets
2.	Multivitamin Preparations*		Drops/Syrup Tablet	1 bottle 30 tablets
3.	Multivitamin with Minerals and/or Extracts*		Drops/Syrup Tablet	1 bottle 30 tablets
4.	Vitamin B Complex		Tablet	30 tablets

*Any combinations proven to be therapeutically effective can be acceptable

Ear, Nose and Throat Preparations

1.	Amyl-Meta-Cresol + Dichlorobenzyl Alcohol	0.6mg + 1.2mg	Lozenges	30 Lozenges
2.	Chlorhexidine Gluconate	0.1 2 % O r a l	Solution	1 bottle
3.	Dequalinium Chloride	0.25mg	Lozenges	30 Lozenges
4.	Hexetidine *	0.1%	Solution 1	bottle(500 ml)
5.	Hexidine	0.1gm/100ml, 0.2%	Oral Solution	1 bottle
6.	Hydrogen Peroxide	1.5%, 3%	Solution	1 bottle
7.	Menthol + Eucalyptus Oil + Light Magnesium Carbonate	2% +10% 7%	Inhalation	1 bottle
8.	Saline Solution	0.09%	Solution	1 bottle

*Any preparation proven to be therapeutically effective can be acceptable

Antihistamines And Antiallergics

1.	Chlorpheniramine Maleate	2mg/5ml 2mg, 4mg, 6mg	Syrup Tablet	1 bottle 15 tablets
2.	Dexchlorpheniramine Maleate	2mg/5ml 2mg, 4mg, 6mg	Syrup Tablet	1 bottle 15 tablets
3.	Aminosalicylate	50mg, 75mg	Tablet	15 tablets

Anti-infectives, Topical

1.	Benzoic Acid+ Salicylic Acid	6% +3%, 12% +6%	Ointment	2 tubes
2.	Benzyl Benzoate	25%	Lotion	300 ml
3.	Gamabenzene Hexachloride	1%	Cream	1 tube
4.	Gentian Violet	0.5%, 1%	Solution	1 tube
5.	Salicylic Acid	2%, 5%, 10%	Ointment	1 tube
6.	Selenium Sulphide	2.5%	Suspension	1 bottle
7.	Sulphur	5%, 10%	Ointment	1 tube
8.	Zinc Undecenoate + Undecenoin Acid	20% +5% 20% +2% 20% +2%	Ointment Powder Powder (aerosol)	1 tube 1 bottle 1 bottle

Keratolytics /Caustics Agents

1.	Camphor		Cream, Lotion,	1 tube/bottle
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			Solution	
2.	Salicylic Acid	2%, 5%, 10%	Ointment	1 tube
3.	Salicylic Acid + Lactic Acid + Polidocanol	2gm+0.5gm+0.2gm/10gm	Tincture	10 gm
Topical Agent For Psoriasis and Eczema				
1.	Ichthammol	10%, 20%	Ointment	1 tube
Antipruritics				
1.	Calamine	5%	Lotion	1 bottle
2.	Calamine + Zinc Oxide	4%+3% 15%+5%	Cream Lotion	1 tube 1 bottle
Skin Disinfecting Agents				
1.	Chlorhexidine Gluconate + Cetrimide	1.5%+15%, 0.3%+3%w/v	Solution	1 bottle
2.	Ethyl Alcohol	70%	Solution	1 bottle
3.	Hydrogen Peroxide	3%, 6%	Solution	1 bottle
4.	Iodine	2%	Solution	1 bottle
Dermatologicals, Others				
1.	Methylsalicylate ♣		Ointment	1 tube
2.	Talc Dusting Powder		Powder	1 bottle
♣ Any other rubifacient proven to be therapeutically effective can be used				
Contraceptives				
1.	Drospirenone+Ethinyl Estradiol	3mg +0.03mg	Tablet (film coated)	1 pack
2.	Levonorgestrel (D-Norgestrel)	0.75mg	Tablet	1 pack
3.	Levonorgestrel (D-Norgestrel)+ Ethinylestradiol with/without Iron*	0.15mg + 0.03mg; 0.25mg + 0.05mg, 0.5mg + 0.05mg	Tablet	1 pack
4.	Norethindrone (Norethisterone) + Ethinylestradiol	0.5mg +0.035mg	Tablet	1 pack
5.	Norethindrone (Norethisterone) +Mestranol and Iron*	1mg +0.05mg	Tablet	1 pack
6.	Condoms (Male, Female)			As needed
* Each iron tablet contains: Ferrous Fumarate-75mg				

Miscellaneous				
1.	Aluminum Sulphate +Calcium Hypochlorite + Sodium	Carbonate in the ratio of 23:1:1 by weight	Powder(water treatment powder)	1 sachet

2.	Calcium Hypochlorite + Iron Sulphate + Bentonite+ Potassium Permanganate Polyacrylamide + Sodium Carbonate		Powder(water treatment powder)	1 sachet
3.	Formaldehyde	3 % , 8 % (w/w or v/v)	Solution	1 bottle
4.	Halazone	4mg	Tablet	15 tablets
5.	Iodized Salt			
6.	Sodium Chloride Free Salt		Crystal	1 bottle
7.	Sodium Dichloroisocyanurate	67 mg, 75mg	Tablet	1 bottle
8.	Sorbitol			

Module Syllabus

Module title: Dispensing of Pharmaceuticals I

Module code: PRA2 M2 1017

Nominal duration: 288 Hours (6 weeks) Theory 138 hrs. Practice 150 hrs.

Module Description: This module aims to provide the learners with the basic knowledge, skill and attitude required to apply good dispensing practices.

Unit of Competencies:

- HLT PRA2 05 0611 Sell Products and Services
- HLT PRA2 06 0611 Support Pharmacists by Collecting and Presenting Workplace Information
- HLT PRA2 07 0611 Organize and Maintain the retail environment

Module Outcomes

At the end of the module the learner will be able to:

- Perform dispensing administration tasks
- Apply product knowledge
- Maintain Dispensary information
- Approach customer services and gather information
- Promote good dispensing techniques
- Identify, prepare and present data and information for use
- Demonstrate the importance of hygiene and infection control in the retail pharmacy

Teaching/learning methods

- Interactive lecture
- Demonstration and coaching
- Guided reading
- Case study
- Group discussion
- Observation of health facility and activity

Teaching/learning materials

- Learning module
- Reference book
- Checklists

- Registration book
 - Guidelines
 - Case study
 - Dispensing manual
 - Packaging and labeling materials
 - Prescription paper
 - Drug counseling guide line

Methods of assessment

-  Oral examination
-  Written examination
-  Structured observation
-  Group assignment

Week	Learning Activity	Required Reading /Assignment
Week 1	<u>Day 1</u> <u>Interactive presentation (4 hrs.)</u> ○ Introduction to dispensing <u>Discussion (4 hrs.)</u>  Major function of dispensing <u>Day 2</u> <u>Interactive presentation (2 hrs.)</u> ○ Dispensing Environment ○ Premise and Facility ○ Hygiene and Sanitation <u>Group discussion (2 hrs.)</u> ➤ Dispensary Premise and Facility ➤ Hygiene and Sanitation <u>Skill practice Session 1 (2hrs)</u> ➤ Dispensing equipment's <u>Guided Independent Reading (2hrs)</u> <u>Day 3</u> <u>Skill Practice Session 2 (4 hrs.)</u> ➤ GIT Medicines Arrangement <u>Skill Practice Session 3 (4 hrs.)</u> ➤ CNS and MSS Medicines Arrangement <u>Day 4</u> <u>Skill Practice Session 4 (4 hrs.)</u> ➤ CVS Medicines Arrangement <u>Skill Practice Session 5 (4 hrs.)</u> ➤ Anti-infectives Medicines Arrangement <u>Day 5</u> <u>Skill Practice Session 6 (4 hrs.)</u> ➤ Endocrine Medicines Arrangement <u>Skill Practice Session 7 (4 hrs.)</u> ➤ Miscellaneous Medicines Arrangement <u>Day 6</u> <u>Group discussions (2hrs)</u> ➤ Arranging Medications in Dispensary <u>Revision on all topics (4 hrs)</u> <u>Guided Independent Reading (2 hrs)</u>	Read on role of dispensers
Week 2	<u>Day 1</u> <u>Written examination (4 hrs)</u> <u>Interactive presentation (4 hrs)</u> ➤ Pharmaceutical storage in Dispensary ➤ Normal Storage Conditions ➤ Cold Storage Conditions ➤ Storages for Combustible /Flammable ➤ Secured Storage Conditions <u>Day 2</u> <u>Skill Practice Session 8 (4 hrs.)</u>	

	➤ Arrangement of medicines based on their storage conditions <u>Facilitated discussions (4 hrs)</u> <u>Day 3</u> <u>Skill Practice Session 9 (4 hrs.)</u> ➤ Arrangement of medicines as prescription, over the counter (OTC) and controlled drugs <u>Facilitated discussions (4 hrs)</u> <u>Day 4</u> <u>Interactive presentation (4 hrs)</u> ➤ Prescription and abbreviations in prescription writing <u>Skill Practice Session 10 (4 hrs.)</u> ➤ Interpretation of abbreviations used in prescription <u>Day 5</u> <u>Skill Practice Session 11 (4 hrs.)</u> ➤ Interpretation of abbreviations used in prescription <u>Interactive presentation (4 hrs)</u> ➤ Computer and Medication Information in Pharmacy <u>Day 6</u> <u>Activity (2 hrs.)</u> ➤ Refer available source of drug information from library/skill lab <u>Revision on all topics (4 hrs)</u> <u>Guided Independent Reading (2 hrs)</u>	
Week 3	<u>Day 1</u> <u>Interactive presentation (4 hours)</u> ○ Selling products and customer service <u>Facilitated discussion and guided reading (4 hours)</u> <u>Day 2</u> <u>Interactive presentation (4hrs)</u> 🌈 Principles of Good Dispensing and dispensing process step 1 and 2 <u>Interactive presentation (4hrs)</u> 🌈 Principles of Good Dispensing and dispensing process step 1 and 2 <u>Day 3</u> <u>Skill Practice Session 12 (4 hrs.)</u> ➤ Evaluation of prescription <u>Facilitated discussion (4 hrs.)</u> <u>Day 4</u> <u>Skill Practice Session 13 (4 hrs.)</u> ➤ Evaluation of prescription <u>Facilitated discussion (4 hrs.)</u>	

	<u>Day 5</u> <u>Interactive presentation (4hrs)</u>  Principles of Good Dispensing and dispensing process step 3 <u>Skill Practice Session 14 (4 hrs.)</u> ➤ Evaluation of prescription <u>Day 6</u> <u>Revision on all topics (4 hrs)</u> <u>Guided Independent Reading (4 hrs)</u>	
Week 4	<u>Day 1</u> <u>Skill Practice Session 15 (4 hrs.)</u> ➤ Evaluation of prescription <u>Written Assessment (1 hrs)</u> <u>Facilitated discussion (3 hrs.)</u> <u>Day 2</u> <u>Interactive presentation (4hrs)</u>  Principles of Good Dispensing and dispensing process step 4-6 <u>Skill Practice Session 16 (4hrs.)</u> ➤ Evaluation of prescription <u>Day 3</u> <u>Skill Practice Session 17 (4hrs.)</u> ➤ Evaluation of prescription <u>Facilitated discussion (4 hrs.)</u> <u>Day 4</u> <u>Facilitated discussion (4 hrs.)</u> ➤ <u>Case Scenario</u> <u>Facilitated discussion (4 hrs.)</u> ➤ <u>Case Scenario...Continued</u> ➤ <u>Day 5</u> <u>Interactive presentation (4hrs)</u> ➤ <u>Dispensing for in-patients</u> ➤ <u>Dispensing errors</u> <u>Facilitated discussion (4 hrs.)</u> <u>Day 6</u> <u>Revision on all topics (4 hrs)</u> <u>Guided Independent Reading (4 hrs)</u>	
Week 5	<u>Day 1</u> <u>Written Assessment (1 hr.)</u> <u>Skill Practice Session 17 (3hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 2</u> <u>Skill Practice Session 18 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps	

	<u>Facilitated discussion (4 hrs.)</u> <u>Day 3</u> <u>Skill Practice Session 19 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 4</u> <u>Skill Practice Session 20 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 5</u> <u>Skill Practice Session 21 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 6</u> <u>Revision on all topics (4 hrs)</u> <u>Guided Independent Reading (4 hrs)</u>	
Week 6	<u>Day 1</u> <u>Skill Practice Session 22 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 2</u> <u>Skill Practice Session 23 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 3</u> <u>Skill Practice Session 24 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 4</u> <u>Skill Practice Session 25 (4hrs.)</u> ➤ Dispense medicines using the six dispensing steps <u>Facilitated discussion (4 hrs.)</u> <u>Day 5</u> ➤ <u>Written assessment (2 hrs.)</u> ➤ <u>Oral Examination (6 hrs.)</u> <u>Day 6</u> ➤ <u>Oral Examination (8 hrs.)</u>	